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NOTES FROM THE BANNER APIARY.

NO. 74.

HOW SHALL WE MAKE THE MOST PROFIT?

OUGHT not Mr. Doolittle's heading to his article, on page 13, to have been, "Few or many *bees:* which?" instead of "Few or many *colonies:* which?"? It is *bees*, not *colonies*, that overstock our fields. Mr. Doolittle discusses *overstocking*, but not one word in regard to his subhead, "Shall we have a few bees in many hives, or many bees in a few hives?" You know Mr. Heddon, Mr. Dadant, and myself, have been discussing "Small vs. large hives," and when I read Mr. Doolittle's two titles I was, of course, interested, and read the article eagerly, only to be disappointed in not finding a word upon the subject. I fully agree with Mr. Doolittle, however, in thinking that so many bees can be kept in an area that the profits would be greater were a less number kept; but whether they shall be kept in few or many hives, is entirely another question. In my opinion, we lose when we go *too* far in either direction in the size of hives. I would have a hive of such a size that a queen of average prolificness would *fill* the combs with eggs, and *keep* them *full* of brood, during the fore part of the season; but as this question has been discussed at length in the *A. B. J.*, it will hardly be advisable to go into it here. The large amounts of grain, fruits, or vegetables, that have been produced upon an acre as the result of high manuring and much labor, are not proper comparisons for the profitableness of the raising of large amounts of honey from only a few colonies. "Circumstances alter cases," and these cases are entirely different. All products are the result of labor and capital; and not only in bee-keeping, but in all industries, we should strive to secure the greatest profits with the least expenditure of capital and labor. Where "intensified" farming, as it is called, is practiced, is usually where land is high. The largest part of the capital is invested in land, hence it follows that labor is used freely in order that the immense amount of capital may be utilized. But let us go "out west," where "Uncle Sam" will "give us all a farm;" will "intensified farming" pay there? No. When the settler has put one acre into crops, with ordinary care it will pay him better to put the same amount of labor upon another acre (that costs next to nothing), rather than to bestow it upon the first acre. "Circumstances alter cases;" and which is the more expensive factor should be well considered, not only in farming and bee-keeping, but in *all* industries.

The question is something like: Here is an area of honey-producing flora; how shall we secure the nectar, with the least expenditure of capital and labor? or let us put it in a little different form. A man wishes to engage in bee-keeping. He has an unlimited amount of capital and labor; in what proportion shall he combine them? In bee-keeping, capital is the less expensive factor, and should be substituted for labor when possible. As to *how many* bees should be kept in one locality, is a question of overstocking, and is a very difficult one to decide; but when the question is one of many bees and little labor, vs. few bees and much labor, the former is to be chosen.

There is, however, another phase to this question. Many bee-keepers are limited as to capital, and it is impossible for them to secure so many bees as could

be kept to an advantage in their locality; such bee-keepers will probably find it to their advantage to employ all the labor *necessary* to secure all the honey that their bees can gather.

I agree with you, friend Root, in advising us to keep our colonies strong, *except* that I would have them strong per *comb;* or, to be more explicit, I see no advantage in *large* colonies, but I want a large number of bees per *comb.*

EIGHT OR TEN FRAMES: WHICH?

As Mr. Buchanan, on page 8, brings up some points that have not been touched in the discussion upon this subject in the *A. B. J.*, it is with pleasure that I reply to them. He must have put some very poor workers into the 8-frame hives the first year, to have received no more surplus, and then had to feed them the next spring. Had he received more surplus from the 8-frame hives, and *then* had to feed the bees, it would have appeared reasonable; but the statement as now given appears to prove *too* much. If there were more bees in the 10-frame hives, then they should have eaten more honey, and needed feeding, just the same as the bees in the 8-frame hives. If there were no more bees in the 10-frame hives, why should they have stored more honey?

It is true, as Mr. B. says, that bees in small hives are more likely to need feeding; but the reason is, that the brood-nest occupies the combs to the exclusion of the honey, which is, of necessity, placed in the surplus apartment. My comb honey, some part of which the contraction method forced into the sections, netted me this last year about 16 cts. per lb., and was replaced in the brood-nest with sugar syrup at a cost of about 5 cents per lb. It is true, that Mr. Heddon is selling his fall honey at 7 cents; but I believe he has explained why he raised extracted honey this year. It was because he had a large stock of empty combs, and wished to utilize them. When extracted honey is raised, there is, of course, but little advantage in contracting the brood-nest; at least, so far as pieces are concerned; but when a bee-keeper finds it necessary to substitute sugar for honey in the fall, in order to winter his bees, it is a *great* point. It may not be advisable for farmers or careless people to use small hives; perhaps they had better not keep bees at all; at least, so far as profit is concerned; but this question is one of considerable importance to the professional bee-keeper.

It is true, that bees in small hives are more likely to swarm; hence small hives are not advisable, for *this* reason, for those who wish little or no increase. The question of swarming vs. no swarming is too large to be handled in this article. I will say this much, however: I have (with the exception of one season, when the harvest came early and was cut short early) secured more honey from a colony (and its increase) that swarmed, than from one that did not. If swarming could be prevented *entirely* it might be an advantage, as an apiary could be left to itself part of the time; but when part of the colonies swarm, and some one must be present all of the time, they might as well *all* swarm.

Mr. B. speaks of the trouble of contracting the brood-nest, disposing of combs removed, returning them again when needed, cost of sugar for feeding, *preparation and cost of feeding*, and the lessened room above the brood-combs for sections. The only valid objection is the one I have put in italics. It is no more work to remove the combs than it would be to remove the same number of combs from any hive when running for extracted honey. The contractors, or "dummies," not mentioned by Mr. B., cost something, about 10 cts. per hive; that would be about one cent a year per hive. It takes no longer to extract the honey from these combs than from any. Extracting-combs have to be stored away for winter, so we will store away these where they are to remain all winter. In both instances the combs must be replaced in the spring. Sugar does not cost so much as the honey that it is used to replace. When every thing is conveniently arranged for feeding, the cost of preparation and feeding, including feeders, will not exceed 5 cts. per hive. Can we not bear this expense, if it will enable us to successfully winter our bees, even if there were no other advantages? The lessened room above the brood-combs is no objection when the bees are crowded for room.

You, friend Root, say that the greatest objection to an 8-frame hive, aside from those given by Mr. B., is, that it could not be made interchangeable with 10-frame hives, when made on the Simplicity plan. Let us first decide which sized hive is the *better*. If the narrow hive is the better, then it is a serious mistake to make any more 10-frame hives. It might not seem so at first, perhaps; but, in *time*, the best will be used. I am aware that it is an advantage if a new thing can be used with an old one, and that the old one will not have to be thrown away; but in a progressive industry like bee-keeping, the old *must* give way to the new, *provided* the new is better. The old box hive *had* to give way to the movable-comb hive, and "'twas ever thus," the *best* will be used, and those who cling to poorer implements because they don't like to throw them away, are left in this race.

WIDE FRAMES AND SEPARATORS.

I should like to say a few words about your review of Mr. Heddon's book; but this article is already becoming quite lengthy. I feel that I must notice one thing, however, and that is the following: "It is a little amusing to see friend Heddon go back and declare in favor of wide frames, and *separators* also, after the way he has denounced them a year or two back. If I were he, I would be a little more mild in denouncing any thing, especially if I expected to change my plans within a year or less."

Can you show, friend Root, where he has harshly denounced wide frames or separators? I have spent half a day in "reading up" what Mr. H. has written upon the subject, going back not only "a year or two," but *four* years, and it seems to me that the remarks of yours are too severe. Away back in 1883, page 315, *A. B. J.*, he says: "Several correspondents have asked me if I considered it advisable to use separators with wide frames. I will reply, that I do. When I run 34 wide-frame supers, I tried omitting the separators. I find that, while the 'case' seems not to need separators to get reasonably straight combs, the wide frames are almost a total failure." In the fall of 1884, at the Northwestern Convention, see *A. B. J.*, page 679, "a vote was taken, and about three-fourths of the members could dispense with separators." Mr. Heddon said: "We have used a large number of one-story wide frames, in supers with separators, and a large number of cases in which no separators were used; and although there are advantages and disadvantages in separators, yet they have nothing to do with the amount of honey stored. Although only one-fourth of you now vote in favor of separa-

tors, *the time may come when you will vote the other way.*" (Italics mine.) "If you can produce honey without separators, so that it will suit yourself, your commission man, the consumer, and everybody, all right; if you can not, then use them."

Last May, in GLEANINGS, page 344, was an article entitled "Wide Frames and Separators." Mr. Heddon gives us all, upon this subject, that I have been able to find from his pen in GLEANINGS for the past four years. In that article they are certainly not denounced. Please allow me to quote: "I would rather abandon separators than use them in two-story supers. I do not think there is any system of using separators, equal to the wide frame, *when used one story high.* There are many advantages in the use of separators, and many in the non-use. I mean to continue the use of separators, and am now perfecting a different style of supers which I think will aid us greatly in their quick and easy manipulation, as well as their usefulness."

Please turn to the article, and read the whole of it. I can not find that Mr. Heddon has ever *denounced* separators; he has claimed, and still claims, that marketable combs *can* be secured without them; he has *always* admitted that there were advantages in their use, especially when used in connection with wide frames. He has always opposed wide frames *two tiers of sections high;* but he has freely admitted, that, when used one tier of sections high, wide frames have decided advantages, and has at times been at a loss to know which to use, the frames or his case. Before he had proved the advantages of reversing the sections, he had about decided in favor of the case The advantages of reversing the sections turned the balance in favor of wide frames and separators. Is there any thing *amusing* about this?

I should also like to say something about "interposing two sticks and a ⅜-inch air-space" in the center of the brood-nest, but must wait until next time. W. Z. HUTCHINSON.

Rogersville, Mich.

Friend H., I think from what you say, that perhaps I *was* a little severe on friend Heddon in regard to the separator business. I beg his pardon, and I thank you for correcting me. Perhaps it was wide frames to hold two tiers of sections that I had in mind. But I think you will agree to this: That when he adopted his new arrangement of a year ago or more, he decided to abandon separators; for it is almost out of the question to think of using separators with a case made in that way, and I believe the brethren generally understood that Heddon, by adopting that style of case, concluded that the advantage of separators was not sufficient to think of retaining them. Now, however, just as a good many of us are thinking of abandoning our old arrangements, and using the Heddon case so much talked about, he has dropped it and substituted a wide frame with separators. Of course, the wide frames hold only one tier of sections. I suggested that he had, very likely, good reasons for the change; but in view of making such changes, would it not be best for all of us to be a little slow in declaring or even deciding we have got the thing just right where it ought to be? These changes in implements, hives, and arrangements, are very demoralizing, and I don't blame a good many for saying, "I am not going to change any more until I can see some *very* good reason," and that this very good reason shall continue for at least a year or two.

COULD A COLONY OF BEES WINTER IN A GLASS BOTTLE?

A HINT IN REGARD TO MORE VENTILATION FROM THE ENTRANCE.

IN your comments on my article in GLEANINGS of Jan. 15, you ask the above question. Theoretically, if there is any truth in what I believe and act upon, a globular bottle made of thin glass, of a size only sufficient to contain a colony and its stores, the neck pointing downward, and about 2½ inches in diameter, with all except the opening protected by some non-conducting material, would be a perfect wintering hive. Of course, in practice we can not use hives of this shape, nor would I recommend glass as a good material to make hives of.

I do not mean to say that we could confine all the animal heat in such a hive, nor do I think that this can be done in any hive we can use, unless the outside air is of the same temperature as that on the inside. Two bodies of air of different temperatures can not be prevented from intermingling as long as there is a passage between. A good colony, packed as I would have them, will send a constant current of warm air out of the entrance. If openings are permitted in the top of the hive, the amount of heat thus lost will be vastly greater.

I wonder how many of those who claim that bees hibernate, or, in fact, of bee-keepers in general, know how much heat a colony of bees gives off. When the heat is allowed to pass through the top of the hive into the open air, there is no way of determining this waste. When a hive is closely sealed at the top, and well protected from the cold, almost all escape of heat is by means of the entrance. When this is covered with snow, something of an index is afforded as to the amount of waste heat by the melting of the snow. I am a firm believer in the letting-alone policy during winter, and consequently my hives are frequently covered with snow for a month or two. When covered in this way, the snow soon begins to melt away from the entrance, and I have often seen a wedge-shaped space thus melted, the width of the hive, five or six inches thick at the base, and almost as high as the hive. After this quantity is melted, the melting stops, as the snow gets so far away from the entrance that the outcoming air is cooled before reaching it. By careful estimation and experiment I have found that five pounds of snow are often melted by a colony in this way. I am sorry to say that I do not know just how long it takes them to do this. The present winter has not been a good one for finding this out. Speaking from memory, I should say that when the weather continues not much below the freezing-point, this amount may be melted in less than a month.

Now, to melt five pounds of snow requires 400 heat units (pound centigrade). This is an amount of heat sufficient to raise four pounds of water from the freezing to the boiling point, or enough to warm nearly ten and a half pounds of ice water to 100°, the natural temperature of the bee-hive. Re-

member, this is only the waste heat flowing out of the entrance during a period of certainly not more than a month and a half, and I think not over half that time.

It would be impossible to confine all the heat generated by a colony of bees by any method of outdoor wintering. The plan I have advocated comes nearer to it than any thing else.

Some might say, "Why not close or contract the entrance, and thus save more, or all of the heat?" The difficulty then would be to get rid of the moisture. We should have to run the risk of its ill effects, or employ upward ventilation, and thus waste more heat than by free downward ventilation.

Perhaps we may yet find out how to do it. I intend to keep on experimenting; but in the meantime my main dependence will be on small hives, large entrances, and enameled cloth above, well protected by chaff. 8—J. A. GREEN, 85—100.

Dayton, Ill., Jan. 21, 1886.

Friend G., you strike on a point that has often been in my mind, and has been a good deal talked about in years past, and I can not now see why it is that we have not made more of it than we have. It is this: Making the hive close and tight, all around, except the entrance, and leave that large enough to give all ventilation needed. The best colonies of bees I ever had were those that were strong enough to send a draft of warm air out of a good-sized entrance all winter long. You remember that this matter is touched upon in the A B C book; and while we are about it, I should like to see the experiment tried, of wintering a colony of bees in a large-mouthed glass bottle, say a two-gallon candy-jar. I believe with you, that it could be done, and I should not wonder if it would be one of the keys to success. The way to do it is to put some foundation in the candy-jar, and get the bees to build it full of comb, then fix it upside down, with three or four inches of chaff covering every part of the jar except the mouth. Leave the mouth open all winter, like a good many suspended box hives without any bottom. It is my impression, that the bees would take care of themselves, even if their stores were not extra. Who will try it?

MANY OR FEW COLONIES: WHICH?

FRIEND C. C. MILLER CONSIDERS THE MATTER PRETTY THOROUGHLY.

ON page 22 Mr. Root asks me, "Would it not be better to take a little of the advice Doolittle gives in the present number, and get larger yields from fewer colonies, or else have them scattered more in different localities?" Now, Bro. Root, don't you know you ought not to rile me in that reckless manner? You needn't think, because I'm little, and you have Doolittle to help you, I'll stand *every* thing; so, here's at you both. As you ought to know, from my saying I hauled my bees away in the spring, I did not keep them in one apiary, but in two. That made about 90 colonies in each. Do you think a less number would have done any better? Moreover, my spring count, 179, was only 5 more than I had in 1882, when from 174 I took 16,549 lbs., to which you refer as an enormous yield. I have read Bro. Doolittle's article twice over. It is exceedingly interesting, and a valuable contribution toward the exploration of that region which, he very truly says, is "well deserving of our best thoughts and efforts." From the premises given, however, I do not make all the conclusions he and you seem to make. He says, "There seems to be a growing tendency of late to multiply our number of colonies, rather than see how good results can be obtained from a few." If this means, to possess a large number of colonies, without reference to the profit therefrom, the tendency is wrong: if it means, to multiply our number for the sake of multiplying our profits, rather than see what large yields per colony we can secure from a few, then the tendency is right. It has been too much the case that exceptional instances of large yields from a single colony have been quoted as patterns to be imitated; as, where A, with 50 colonies, gets 500 or 1000 lbs. of honey from a single colony. From his whole apiary he gets 4000 lbs., while B, with an equal number of colonies, gets 5000 lbs., getting from no colony more than 150 lbs. It is well enough to talk about A's big yield; but after all, I had rather imitate B's example. Of late years I have had some misgivings as to some of these large yields from single colonies. Not but that the owners mean to be perfectly truthful, but there are so many ways in which we may be mistaken. A few years ago I had a colony which gave me, if I remember rightly, 194 lbs. comb honey. If you had asked me, I should have asserted very positively that they had no help in any way, more than every other colony, and should, perhaps, been indignant if you had suggested there might be any mistake. I would not be so positive now. Without remembering it, I might have given them some partly finished sections, or, without my knowledge, another colony might have united with them.

There are many circumstances to be taken into consideration in deciding the proper number of colonies to be kept. Not only the resources of the field, but the experience, ability, tastes, and desires of the bee-keeper are to be considered. I believe I would place my own limit something like this: That number from which I can make the most clear money annually, due regard being had to my own enjoyment in the work. I once asked Bro. Doolittle why he did not keep a larger number of colonies, and I think he told me he did not want a greater number than he could care for without outside help. He probably is unwilling to take the extra profit he might have from a larger number, and pay for it in the price it would cost him in the worry the extra help would cause him. I respect his taste in the matter; and yet, another man seems to enjoy the bustle of a lot of hands under his direction, and his taste should be equally consulted. In one respect I am most fully in accord with you, and would like to emphasize the statement, that "the mania for rapid increase is oftentimes a very sad one." One thing bearing on this matter is not generally considered: Where bees are wintered in cellars, a score might be wintered in a given space, where one or two hundred would fare disastrously, and from no other reason, I think, than the greater number. Then the amount of pasturage must be considered; and here, Bro. Doolittle, is another important unexplored region. You refer, Bro. Root, to reports of beginners getting large yields from a few colonies,

who afterward fail to get like results from large apiaries. Perhaps the work of beginners is apt to be more fully reported than those longer in the business; but, may not overstocking have something to do with the matter? I am not sure but my ground would be overstocked at some time of the year with any thing more than five or ten colonies. There are from five to eight weeks during apple-bloom and clover, when my bees have all they can do. During the rest of the time they are comparatively idle, although there may be no day when some bees do not bring in something; but the ground is overstocked for perhaps twenty weeks. It may be, that enough is gathered to keep busy five or ten colonies, and I imagine that, with this number, having six months to work in, I could make a pretty big report.

There is one point you make, Bro. Doolittle, that can not be disputed. If a given field yields, say, 45,000 lbs., and each colony uses for its own support 60 lbs. annually (I suppose they would use more than 60), then the fewer bees you can have to clean the field, the more honey you will have as surplus.

When it comes to having large numbers, additional help must be obtained, and comparatively few have the ability to superintend others successfully; so, because a man makes a grand success with just enough colonies so he can do all the work himself, it by no means follows that he would be successful with double the number, no matter how large the field nor how much help he might have. But I'm afraid I'm getting on the wrong side of the question, and must return to the charge on Mr. Root.

In 1881 I had the fewest colonies (67), and the largest average yield (117 lbs.) I have had in several years. In 1884 I had the most colonies (200), and the smallest average yield (54) in the same time. Now, which was better for me? It sounds better to say, 117 lbs. average than 54; but when 54 gave me a total crop of 2877 lbs. more than the 117, that settles it in favor of the many colonies and the small average yield. It is, however, quite possible that the best number lies somewhere between these two extremes, and that, with 175 colonies in 1884, I might have had a larger crop than with the 200. Certain it is, I do not care to have more than, if as many, as 100 colonies in one apiary. Now, Mr. Root, don't you see I don't need Bro. Doolittle's advice? and don't you wish you hadn't "riled" me?

TWO CHIPS.

On page 43 a statement passes unchallenged, that "moist air is heavier than dry air." Is this so?

My sub-earth ventilating pipe is 4-inch tile laid 3 or 4 ft. deep, and 100 ft. long. Much to my surprise, I have pretty strong proof that a longer pipe would not bring in air one degree warmer.

C. C. MILLER, 179—340.

Marengo, Ill., Jan. 21, 1886.

No, friend M., I don't wish I hadn't "riled" you, a bit; in fact, I would do it again right off now, if I knew just how to do it as well as I did the other time. I am very much obliged for the facts in regard to sub-earth ventilation, and I am surprised also; but I propose to use the information, not only for ventilating bee-cellars, but for making a greenhouse that will grow hardy plants and vegetables all winter long, with no artificial heat whatever. "Father Sun" and "Mother Earth" are to do all the heating, and you see if I don't get good results. Very likely I shall have to use shutters over the glass in extreme weather.—Now, in regard to this matter of many or few colonies, I believe, after all, you have considered the matter about as thoroughly as myself or Bro. Doolittle, and I think it will pay us all to read your article several times over. In our business of selling bees and queens, we make it pay to keep 400 or 500 colonies in one location a part of the year, although we have for several years back been reducing them to about 200 each fall; but as we buy something like 100 colonies from our neighbors each spring, no doubt it would pay us to winter over 300; so you see it makes a difference whether a man raises honey alone, or bees and queens as well as honey; and from our standpoint of view it seems to me it would be a pretty good thing for you, friend M., as well as honey-producers in general, to be prepared to sell bees, at least occasionally, when the season happens to favor the production of bees rather than the production of honey. See what our friend Oliver Foster did, even in selling bees by the pound, at a great deal less figure than the usual prices.

OLIVER FOSTER'S REPORT FOR 1885.

HOW HE SUCCEEDED, IN SPITE OF UNFAVORABLE WEATHER.

We notice a marked variation in the reports of the honey crop in Iowa for the past year, which demonstrates that one year a few miles may separate good honey-producing localities from poor ones, whereas the next year these dividing lines may not exist, or the blessings may fall in other fields.

In this locality the past season has probably been the most unfavorable one of the ten in which I have been engaged in bee culture. In the fall of 1884 I packed in chaff, 280 colonies of Italians on their summer stands, in three apiaries. About 50 of these were three and four frame nuclei, and a large proportion of the others were made up of united nuclei.

After one of our severest Iowa winters, followed by a very cold late spring, the first of last May found me with 250 colonies in average condition, and with a fair prospect of selling them all before the honey harvest began, as per the editorial warning on page 601. I had bought 12,000 sections, and was planning to have them filled; but as many of the friends had lost bees heavily, and were anxious to have more, I decided to leave the sections in their boxes, run all three apiaries for increase, and let them *go*, and they *did* go, many of them before the increase came. By withholding advertisements all orders were filled promptly, except a few that included dollar queens before they could be furnished. We had no honey-yield worthy of mention, until white-clover bloom. The clover had winter-killed badly, except in sheltered places, and it yielded about one-fourth of a crop. Basswood did no better; many of the trees did not bloom at all. Had it not been for a fair yield from late bloom, many colonies would have been short of winter stores.

My account with the bees for the year foots up as follows:

To supplies, including circulars, postage, advertising, use of hives, buildings, machinery, horse and buggy, etc.	$236.00
To hired help	110.00
Total expenses	$346.00
By 16 colonies increase (full count)	$ 80.00
" 249 " sold (average $3.54 each)	881.40
" 60 queens by mail	59.60
" 1000 lbs. extracted honey (8 cts.)	80.00
" 300 " comb " (15 c.)	45.00
Total	$1146.00
	346.00
Net profit	$800.00

I now have 296 colonies in two apiaries, all packed on summer stands, and they could not be in nicer shape, apparently, at present writing.

I have been experimenting extensively on the wintering problem as well as on the different lines of summer manipulation, making improvements, as I think, each year, and I intend to publish my methods whenever they can be considered perfected, for it is demonstrated facts that we want, rather than theories. 10—OLIVER FOSTER, 250—296.

Mt. Vernon, Iowa, Jan. 13, 1886.

Why, friend Oliver, I had some way got it into my mind that you were a *small* bee-keeper, and here you are with 296 colonies, and doing nicely, even during a dull season. Best of all, you seem to be pleasing your customers right straight along; and, friend F., it does my heart good to have you speak of honey-yields as blessings from God. To be sure, they are blessings; and if more of us were in the habit of taking them that way, I shouldn't wonder if it would be safer for God to send more of them.

OUR OWN APIARY.

THE CONDITION OF AFFAIRS UP TO DATE.

ABOUT a week ago, during a warm spell, our bees were examined and were found to be in good condition. Yesterday Jan. 27, while strolling through the apiary I noticed that the entrance of one of the hives was spotted considerably, indicating dysentery within. The slate showed that this was an imported Holy-Land stock. At the beginning of the winter season I had noticed that these bees were very uneasy, and after a fall of snow they flew out even then. The snow, everywhere in the immediate vicinity of the hive, was spotted with little holes made by their chilled bodies. The apiarist says they acted like that last year, and that they barely pulled through the winter.

CLUSTERING OUT IN JANUARY.

Toward evening of the same day my attention was called to another hive where there was quite a bunch of bees hanging out at the entrance. Peering down into the hive after lifting one edge of the cushion up, we found that the bees were scattered through the interior of the hive, when seemingly they should have been quietly bunched up. Lifting one end of each frame separately, showed that there was scarcely 3 lbs. of honey, when, about two months ago, they had 25 lbs. of choice sealed honey. When put into winter quarters, inasmuch as it was a large swarm, it was supposed that they were in prime condition for wintering. Their restless condition, coupled with the fact that they had consumed such a large amount of stores, seemed to indicate that they did not then and had not enjoyed that quiescent state, or hibernation, as W. F. Clarke calls it.

BREEDING IN CHAFF HIVES IN JANUARY.

Jan. 28.—To-day the swarm mentioned in the above was overhauled to ascertain the trouble. It was a rousing big swarm when put up for winter, and the apiarist found that they had been breeding heavily. This accounts for their consuming so much honey; and when the weather warmed up they just crowded out at the entrance for more room.

POLLEN NECESSARY FOR BROOD-REARING.

A careful examination of each comb showed that considerable pollen had been stored in the bottom of the cells, although the combs, when given them in the latter part of the fall, apparently contained nothing but choice honey. The presence of the pollen, together with the fact that it was a strong colony, well packed, undoubtedly induced the brood-rearing; and inasmuch as the honey was running short, the bees were probably compelled to consume more pollen than was consistent with healthful wintering. As a proof of this, the neighboring hives were considerably spotted. This would also account for their uneasiness. A report of these will be given later.

ERNEST R. ROOT.

BRUSHES FOR PAINTING BEE-HIVES.

ALSO SOMETHING ABOUT LOW-PRICED BRUSHES FOR OTHER PURPOSES.

TWO or three years ago we wrote to one of the largest brush-manufacturers in the East for prices of brushes suitable for bee-keepers. At the time, they declined to give us figures, but referred us to dealers in the large cities. I objected, and proposed to give them an order as large as the city jobbers; but as our institution was something not laid down in the books, they preferred not to sell to us direct. Of late, however, they have modified their views a little. I do not know whether it is because the Home of the Honey-Bees has grown bigger, or because the general depression in business has made manufacturers more anxious to open trade in almost any avenue. However, they sold me the brush I wanted. Providing I would take five gross at a single lot, they would let me have them so I can offer them to you at 10 cents each. Below is a picture of—

OUR TEN-CENT PAINT-BRUSH.

Perhaps I should not call this a paint-brush, but it does very good service for many kinds of painting. It is really a small-sized paint-brush or a large-sized sash-tool, and is very convenient for putting on mucilage, labeling honey-jars, moistening sections when they are too dry to fold otherwise, and many other like things. If wanted by mail, add 3 cts. each extra for postage. We can furnish larger-sized paint-brushes at correspondingly low prices. Our best one is worth 50 cts.; by mail, 8 cts. each extra.

WINTER TEMPERATURE OF BEES.

A REPLY TO G. M. DOOLITTLE'S ARTICLE, PAGE 190, MARCH 15, 1885.

MR. DOOLITTLE has laid his fellow bee-keepers under an obligation of gratitude by his thermometrical observations in regard to the degree of heat maintained inside a cluster of bees during the winter, as reported on page 190. Though his experiments have conducted him to a conclusion unfavorable to my views concerning hibernation, he has my thanks none the less; and I hope to show him, before I have done, that he has decided against hibernation on insufficient evidence. At any rate, I shall try to do so.

At the outset, however, let me say that the *American Apiculturist* is in error when it states, concerning entomologists, that "not one of this class can tell us any thing reliable about the winter temperature of the bee-hive." Huber, Reaumer, Newport, and others, have given us information, which, considering the sources of it, must surely be regarded as "reliable." Mr. Newport especially, made numerous experiments to ascertain the temperature of the interior of bee-hives in winter, which he recorded in a valuable paper published in the *Philosophical Transactions*, entitled "On the Temperature of Insects."

Huber tells us, as the result of his observations, that "the heat in a well-peopled hive continues 86 or 88 Fahrenheit, when it is several degrees below zero in the open air." He also says, that bees "then cluster together and keep themselves *in motion* in order to preserve their heat;" and that, "in the depth of winter, they do not cease to ventilate the hive by the singular process of agitating their wings before described." Mr. Newport was of the opinion that Huber was altogether in error in assigning a heat of 86 or 88 Fahrenheit to a populous hive, which, he contends, has its temperature sometimes (though rarely) lower than that of the freezing-point, and in the winter months does not average more than from 7 to 9 degrees above that of the atmosphere, or about 52, though merely tapping on the outside of the hive, by exciting the bees, will, at any time, greatly increase the heat: in one instance, Feb. 2, to 102°, when the temperature of an adjoining hive was only 48.5°; and it is from this circumstance that he supposes Huber's error to have arisen, as the mere excitement caused by introducing a thermometer is sufficient to raise the heat to the point (86° or 88°) which that observer mentions. Mr. Newport admits that hive-bees are never strictly torpid, but *pass the winter in a state of hibernating sleep*, liable to constant interruption by considerable variations of external temperature or accidental excitement.

Mr. Doolittle's experiments prove the extreme difficulty, if not utter impossibility, of ascertaining the normal temperature of the interior of a bee-cluster; for the moment the bees are disturbed and excited, the heat begins to increase. It is natural to suppose that the bees at or near the outside of the cluster will be cooler than those at the center of it; yet they may be, and no doubt are, warmer than the air outside the cluster, owing to the transmission of heat from their companions who occupy an inside berth.

If Mr. Doolittle had noticed my article in the *American Bee Journal* of January 14, 1885, headed, "Chilled Bees are Not Hibernating," he would hardly have made the remark that I call "stiffened" bees "hibernating" bees. I there said, "Chilled bees are *not* hibernating bees, but bees undergoing the process of being frozen to death. In the early stages of this process they may be restored by warmth; but unless thus restored they will die. They are not on the road to death when they hibernate. This is nature's expedient for preserving them alive." I must ask Mr. Doolittle to read the whole article, from which the above is a brief extract.

My belief is, that bees, in a climate like ours, "pass the winter in a state of hibernating sleep," as Newport expresses it. Unable, before going into this state, to take food enough to last them any great length of time, they must necessarily rouse up at intervals to feed. I think they usually do this when spells of mild weather come. But, if the demands of hunger compel them to wake up and eat when the surrounding atmosphere is cold, they have recourse to that faculty of generating heat which Huber mentions, and with which all bee-keepers are familiar. During the present winter (1884–5) we have had scarcely any warm spells; but I have noticed that whenever we did have one there was a hum of activity in my supposed-to-be hibernating hives. This hum I have taken to be the sound of the dinner-gong.

"A well-peopled hive," as Huber calls it, is, no doubt, much warmer than the outer air, even when the bees have fallen into their hibernating sleep. How much I do not know, nor is it easy to find out, because the least disturbance of the bees raises the heat. But I am inclined to think there must be excitement before the temperature becomes 86 or 88°, as noted by Huber. I have observed the phenomenon of warmth under the cushion and just over the cluster of bees, mentioned in the editorial notes to Mr. Doolittle's letter, and so, doubtless, have most bee-keepers. We want to find out, if we can, what that degree of heat should be to enable bees to hibernate comfortably. Then we must try to ascertain the size of cluster, and dimensions of hive, necessary to secure that degree of heat.

I suppose if we could investigate a hibernating bear we should find the outer fur pretty cool; but the roots of the hair imbedded in the hide, would be warmer. Then if we could sink the bulb of a thermometer down to the region of the heart we should, no doubt, find blood-heat there. A cluster of bees, when balled and knotted up as tightly as possible, may perhaps be of the nature of one living entity, the outer bees in a state similar to that of the bear's fur, and the central ones warm as Bruin's heart, and, like that, diffusing heat and life to the whole cluster.

Mr. Doolittle thinks it "impossible for bees to hibernate when they must burn honey enough to warm a temperature of 16 below zero to 63 above." To which I reply: 1. When it is 16 below zero out of doors, it will not be so cold as that inside a chaff-packed hive with sawdust cushion on top, irrespective of heat generated by the bees. When it is 16 below zero in the open air, as it has often been this winter, I have found that it was not nearly so cold inside my wood-shed, which is only a single-boarded building. 2. It would not take much of a lamp to raise the temperature inside a hive, such as Mr. Doolittle experimented upon, to 63 above zero. Is it too much to believe that the respiration of 20,000

bees would suffice to do it? If it is, then we may add to this Huber's theory of motion inside the cluster to make up the deficiency. It is thought by some that there is a constant change of place between the central and outside bees, and this movement may suffice for the purpose. 3. The creation of this heat regulates the consumption of honey, but does not necessarily conflict with the theory of hibernation. Hibernation has its degrees. In the bear, it is profound and complete; with squirrels, it is partial. They rouse at intervals, and feed; so do bees. How often they wake, and what quantity of honey they consume during their waking spells, depends, I suppose, on the degree of cold they have to withstand.

The second paragraph of the editorial notes on Mr. Doolittle's letter states my idea of hibernation to a dot. The naturalist Reaumer describes in a similar manner what he calls "a sort of torpidity" which he regards as the normal condition of bees during the winter season. He says: "In winter, while it freezes, one may observe without fear the interior of hives that are not of glass; for we may lay them on their sides, and even turn them bottom upward, *without putting any bee into motion*." He refers, of course, to old-fashioned box hives. He adds: "We see the bees crowded and closely pressed one against the other: little space then suffices for them." This harmonizes exactly with friend Root's account of his "ball of bees about the size of a large apple," which unlocked itself and expanded so that "they filled the hive pretty tolerably." I say with friend Root, "I should like to have my bees winter in these tight little balls; at least, it seems to me that is what we want." This is what I intend by hibernation; and I maintain, that when we find out how to bring this about every time, we shall have mastered the winter problem.

Speedside, Ont., March 23, 1885. WM. F. CLARKE.

A KIND LETTER FROM CALIFORNIA.

QUEENS TAKING THEIR WEDDING FLIGHT WHEN ONLY 24 HOURS OLD.

IN my little mountain home, many miles away from church privileges, with only towering mountains, rushing waterfalls, and Lytle Creek roaring in its rocky bed, to remind us of Him who made them, your Home talks come to renew and strengthen all that is noble and right.

The year that has passed has been the fallow year to the California bee-keepers. I did not take out a pound of honey; but the bees are in good condition, with ample natural stores. There was no rain from Dec. 21st, 1884, until March 7th, 1885, and but little after that, so there was a dearth of bee pasturage. In March, bees did fairly; plenty of brood. Then came cold weather, which stopped the honey-flow, and lack of moisture did the rest.

I had two natural swarms. I raised some queens for home use. One lot of cells was so large that I watched them closely; on the 14th of June, about 10 A. M., I saw the first emerge. I had given the cell to a queenless colony. The young queen was black, and very large. The next day, about 2 P. M. I saw her on the top of the hive, just returned from her wedding flight, with a filament attached to her abdomen. I took her carefully in my hand, and examined her, lifted the cover, and put her on top of a frame, where the bees began to caress her, and in two days I found plenty of eggs. I was very much delighted, for I never expected to see a queen returning from her wedding flight. I find her bees are hybrids, and very industrious.

THE SUN EXTRACTOR, AGAIN.

The sun extractor for rendering wax is in common use here. I have used it for that purpose four years. It is made like the one described in GLEANINGS. If one sash will not gather the sun's rays so as to have sufficient heat, put another over the first, and that will be *sure* to work.

THE MOTH WORM IN CALIFORNIA.

As Mr. Israel says, people at the east know nothing about the bee moth. It takes hot dry climates to show what they can do. They have never troubled my swarms much, as I watch them; but if one tries to save combs, then comes trouble. In less than a week, five frames had seemingly a thousand cocoons. The space between the frames was packed solid, and I had sulphured them too.

MRS. W. W. WILSON.

San Bernardino, Cal., Jan. 2, 1886.

Thanks for kind words for the Home Papers, my good friend.—Your fact, to the effect that a queen may take her wedding flight the day after she is hatched, seems pretty direct; but still there is a possibility for a mistake. Your queen may not have left the hive at all, and another one resembling her may have alighted on the hive. Under such circumstances she would probably be well received, and commence laying as you suggest. As others, however, have reported that queens do sometimes take their flight when one day old, it may be so, though it is very rare. In such cases we should suppose the queen was very fully matured before emerging from the cell. Your California climate may have something to do with it.—In regard to the solar extractors, I can not yet feel quite satisfied that two thicknesses of glass will give more heat than one. Have the friends tried both ways, enough to be sure that the second sash is an advantage?—Very likely the moth are worse in California because you have no zero freezes to kill them out of combs not protected by the bees.

BEE-KEEPING IN KANSAS.

SOME REASONS WHY THE BUSINESS CAN BE CONDUCTED SUCCESSFULLY IN THIS STATE.

THE season of 1885 was a very poor one, being too wet until August, which, as usual, was a little dry. Spanish needles began to bloom Sept. 1, when a heavy rain fell, which destroyed all the early blossoms. From the later bloom, which lasted about ten days, the bees filled their hives (which were destitute of stores), and I took from four colonies 110 lbs. of nice section honey in 1-lb. boxes.

I began with 8 colonies — 7 strong and one weak. I increased to 14, all in good condition for winter. I think I have learned a valuable lesson this season, which is this. If I had fed my bees early in the season, to stimulate, I should have had 100 lbs. more honey to have sold. I sold my honey at 20 cts. per box, at our little town of Edna. I shall try a little extracted honey next season. The people here think that extracted honey isn't pure; but I

believe I can persuade them to use it in preference to comb honey, by getting a few copies of T. G. Newman's "Honey as a Food and Medicine," which I can hand to my retailer to give to his customers.

In regard to the honey-producing plants of this section of Kansas, I will say we have no bloom after apple (excepting a few prairie flowers) until the first of Sept., when the Spanish needle and golden-rod bloom. For the last year only has white clover been sown, and then only in door-yards. I'm trying to persuade the farmers to sow the seed in their pastures, as it catches very quickly on the prairie sod. Basswood grows finely here. Two of my neighbors have several small trees growing, which look nicely for the time they have been planted—2 years. I intend to plant a few hundred as soon as convenient.

I think this will be a fine country for bees when we get plenty of white clover and other small honey-producing plants growing. One great advantage in bee culture here is the winters being mild, although we have some severe cold spells which last but few days—never so long as to prevent bees from flying during any month in the winter. As to chaff hives, I think they are of little use here, as the Simplicity, with division-board and good chaff cushions, affords ample protection. I have been handling bees for four winters here in this State, using only the duck quilt as protection, and I have never lost a colony. But I think bees might be more profitably wintered by the use of chaff cushions.

This fall I prepared my bees for winter as follows: 8 colonies have 6 frames each; 4 have 5, and 2 the full 10, all of which are well filled with sealed honey. I use the L. frame and Scovill Simplicity hive. Those frames containing the most pollen I stored away for spring feeding. My bees are all right up to date; but at present we are having very severe weather—the coldest since I have been in the State.

Now, friend R., I want to thank you for your ably edited journal; also the many able contributors for the valuable information imparted.

6—W. E. POTTS, 8—14.

Edna, Kansas, Jan. 11, 1886.

FLORIDA.

THE ADVANTAGES AND DISADVANTAGES CAREFULLY CONSIDERED; SOMETHING FOR THOSE CONTEMPLATING GOING THERE.

HAVING received quite a number of letters, which still continue to come from persons in the Northern States, inquiring about bees in Florida, the price of land, health, and other things pertaining to Florida, I shall attempt to answer such questions as would likely interest many of the readers of GLEANINGS. In the first place, I had better state that I have been here only one year and one month. Nearly every letter contains the question, "Can I make a living keeping bees?"

In this locality—high pine land, with a considerable number of orange-groves bearing, together with what palmetto there is, an expert might keep himself and small family from the sale of honey alone; but I would not or could not advise any one with a family to pull up stakes and settle in a high pine region, relying on honey alone from his bees to keep him. The orange does not yield honey profusely, but it blooms long—longer than white clover, I believe. The saw-palmetto did not yield much honey last season; besides, it can not be found growing abundantly on all high pine land. It grows on flat and low land. With my present number of colonies of bees I hope to be able to give an interesting report next spring in regard to the above-named honey-plants in this locality. I should think the hammocks and low lands along rivers would be much better for bees than high pine, although such places probably would be deprived of the honey-yield of the orange. But people settling on these kinds of lands, if I am not mistaken, are liable to have malaria. If you want to get as far as possible from malaria in Florida, you must reside on high pine land; then, if you have never had it before coming here, you are not likely to get it. I draw this from my own experience, observation, and conversation.

Another class of land for the bee-keeper is the coast region—Atlantic and southern Gulf coast. I understand these latter places are *excellent* for bees; but about getting the honey into market at a good price, I have not had any information. Nice comb honey, in 1-lb sections, retails at twenty-five cents in Orlando, but extracted honey from the coast sells very slowly at forty cents per quart, or about 12½ cts. per lb. Now, to sum up the location for bees, oranges, and health, I do not think it possible to get one single location *excellent* for all three.

As far as I know, it would be cheaper to bring bees along, if possible to do so, than to buy here; for people having bees do not want to sell them until after the spring honey harvest; yet a few can be bought at eight to ten dollars per colony. If native bees in box hives can be found for sale they usually sell at about three to four dollars per colony. At present I do not know of any.

I was told before coming here that a swarm issuing any month of the year could gather enough honey to keep it. This, I am quite certain, is a mistake, and should be corrected. I am confident that a swarm hived on fdn. the first of this month would have starved to death, for it has been too cold for bees to fly much, and the last recent freeze stopped brood-rearing in all my colonies. Last January was too cold for bees to gather honey, except a *very few days*. Had I hived a swarm on fdn. last July or August, I believe it would have perished before the fall flowers bloomed. I think it is important to know about this, as it shows the honey resources of the locality. Bees will gather enough honey in October to winter on, and rear brood ready for the spring honey-flow.

Five acres of land is all anybody needs to grow oranges and keep bees, and it sells at all prices—from $1.25 to $500 per acre—owing to the prospects of the town. In three miles of Orlando, which is considered the most prosperous place in South Florida, it sells at about $100 or more per acre for first-class orange land. Further away, $60 to $100. Second-class orange land brings about $25.00 to $50.00 less than above. In new settlements, with fair prospects for railroad, good orange land can be purchased at $10.00 to $25.00 per acre. Hammock lands are the best for vegetables; but oranges also are grown on some of these lands with less fertilizer.

Another question from correspondents is, "If I can not get a living keeping bees, what can I do till oranges bring an income?" For various reasons this question is puzzling to answer, because our

Creator, in his wisdom, arranged it so the most natural way to procure a living is to till the soil, and our Florida soil is quite poor. Although a few seem to get some profit out of gardening, yet I think it would be a vexation of spirit to the average farmer, unless on hammock land. Sweet potatoes do well; the squash family grows well; cabbage does fair to well. Everybody does not farm, even in a farming country; and, bear in mind, it is as easy, if not easier, to get a living here, aside from tilling the soil, as in any country. If you have a little loose money —or, rather, considerable—buy town lots, build dwellings, and rent them. Every house in Orlando is rented at a big rent as soon as built. I presume it is unnecessary to say, if a person has no capital, and is unable to work, he should not come to Florida, for the "bread fruit" does not flourish here. The cost of living is some higher than in Ohio, but not so much higher as one might think. I think all the canned goods sell as cheap here as in Ohio. Experience has taught me this: If you are an invalid, and are coming here, bring your woolens and flannels with you. And now let me say, in conclusion, that I have tried to give the plain naked facts; that I have taken more pains, I believe, to show the "*stuff*" of the framework than the veneering with which it is covered; that I have had a cramped feeling, for fear I should occupy too much space in GLEANINGS, but I must utter this: That keeping bees and growing oranges in connection, to me is most fascinating; and he who kneels to the living God may deny himself of many of the comforts and luxuries of life, and still be happy following these two pursuits in this glorious climate of Florida.

Orlando, Fla. L. W. GRAY.

FROM 56 TO 125, AND 8500 POUNDS OF HONEY.

94 LBS. OF HONEY FROM ONE SWARM IN ONE WEEK.

I HAVE had considerable experience in bee culture for the last fifteen years or over. I had bees in the Langstroth hive in the summer of 1863. I then resided at Pendleton, in the county of Prescott, Ont., an excellent locality for bees. That year I collected 1000 lbs. of honey from four two-story hives. This was before I ever saw a bee-journal, or heard of such a thing. I have had some ups and downs since I commenced; still, I have been able to hold my own well, up to the present time. I give your publications the credit of the greater portion of my success. I have shared at times somewhat in Blasted Hopes, but generally caused somewhat by my own neglect.

The season of 1885 I commenced with 56 hives, 10 of which were very poor. I increased to 125, and collected over 8000 lbs. of extracted honey. I have used and wintered bees on frames of nearly all kinds between the L. and the Jones two story and single-story, and the size I like best is a frame 10½×14 inside measure, 8 frames with two-story, gotten up similar to the Simplicity hive. This is a cold climate, and I have been induced to believe that a deeper frame than the L. is a more suitable one for our cold long winters. I do not pretend to give a 16 years' experience in bee-keeping in this letter.

There is one more fact which I wish to add to the report of last season. During the second week of July I obtained from one first swarm, put in empty combs, 94 lbs. of beautiful thick honey. The swarm was hived on Saturday at noon, and the following Saturday noon I removed all the combs from the hive. The queen had deposited eggs in two combs only. This was the third time I extracted during the week. Said first swarm came from a box hive which remained clustered for a long time, as box hives often do, until the box was almost covered with bees.

DON'T EXTRACT TOO CLOSE—A SUGGESTION.

The bees were well rested during their stay in the old hive. This gives me the idea that bees can make up for lost time. I don't believe that it pays to work bees right up to the end of the honey season. If hives are closed in giving them only the number of combs required to winter on quite early in the honey season—that is, after the swarming fever is over—the bee-keeper suffers no loss. For instance, about the middle of July last, after I obtained 8500 lbs. of honey from my 125 hives, I felt sure I should have no more swarms, so I took all combs from each hive, except those intended for the bees to winter on. I then prepared them for winter by closing them up with division-boards, top frames off, covers on tight, and sawdust behind division-board. At this date each hive had a good queen. The question is, Have I lost? did my bees gather honey-dew? I don't think bees will under such treatment. But if I had extracted up to the last of August, all that I could take from them, and left them almost in a state of starvation for a month or so before feeding up for winter, I should expect nothing surer than that my bees would become demoralized.

I have never practiced feeding very much, except when a scarcity of honey comes in mid-summer, or immediately after frost kills the flowers in the fall, which is generally before the middle of September. Then I feed all stock that require winter stores, until they have sufficient. I feed as fast as they will take it up, and then stop. I don't believe that feeding to stimulate breeding after the flowers cease to yield honey and pollen, pays. Bees will not always breed at this season; and if they do, I think bees raised under such circumstances are much inferior to those raised under the natural impulses. Queens bred late in the fall are worthless; worker-bees raised late in the fall are equally worthless—at least, from my experience I think so.

JAMES MOFFATT.

Maxville, Ont., Can., Dec. 25, 1885.

PERFORATED ZINC FOR THE PREVENTION OF ABSCONDING SWARMS.

A GOOD REPORT FOR THE ALLEY DRONE AND QUEEN TRAP.

I WANT to tell you of a little experience that I have had with Alley's combined drone and queen trap, and see if you will not agree with me that, in point of convenience and labor saving it should be ranked along with the honey and wax extractors and smokers. On the 14th day of March, 1884, my son and only child came home from college, sick. His disease was typho-malarial fever, which lasted him 72 days, during which time my bees increased from 20 to 48 colonies by natural swarming. Had it not been for two of the above-named traps that I had, it would have been impossible for me to have secured half the swarms, and at the same time nursed and taken care of my sick child. As it was, when a swarm would begin

to come out I would run and put a trap at the entrance, and by the time I could get my empty hive in place with a few frames of brood from the parent stock in it, and the foundation all right, the bees would miss their queen and come back pell-mell in search of her, and thus enter the new hive at once. In about 20 minutes the bees were hived, and went to work at once without further trouble or ado, and I was back in the house with my sick boy. In hiving them thus I moved the old hive to a new location, and put the new one in its place, and let the queen run in with the bees. It was a beautiful sight to me, to see my golden Italians come pouring in a stream, so to speak, from the top of a tall elm-tree into their new hive, without any climbing of trees or sawing off limbs, thus saving disfiguring the symmetry and beauty of a favorite shade-tree. I had no help, except a neighbor's little boy. After doing the chores at home he would come over and stay a few hours in the middle of the day to watch my bees, and tell me when they were swarming. I do most truly and heartily thank Mr. Alley for his invention, and I would about as soon think of going back to the old gum hive as doing without the combined drone and queen trap. We are having a very mild winter so far here in Texas. It has not been cold enough to form ice worth speaking of but once, and it all melted long before night. We had a nice rain this evening, with a little hail. MRS. S. E. SHERMAN.

Salado, Texas, Jan. 1, 1886.

Mrs. S., I am very glad indeed to get this report from friend Alley's drone-trap. I know friend A. has spent a great amount of time and money in experimenting, with the end in view of getting a device that will do just what you say his has done. I suppose, too, you will excuse me for suggesting that it was not an expert, either, or am I making a mistake? At any rate, my good friend, you made the device work nicely, and surely our veteran bee-folks ought to be able to do as well.

EGG-LAYING OF QUEENS.

SOMETHING FURTHER ON THE SUBJECT, BY OUR GOOD FRIEND CHARLES DADANT.

IN GLEANINGS for Jan. 1st, Prof. Cook writes that the queens know what the sex of their eggs is before laying, and that the dimension of the cells has no influence on the sex, which depends on the arbitrary will of the queen. He admits that some young queens lay drones in worker-cells, but he thinks that it is because they do not know yet how to manage the delicate apparatus of the spermatheca. To support his theory, he adds that Sir John Lubbock has noticed that the female wasps are provided with a wider knowledge, even, than the bees; for not only do they know the sex of their offspring, but they take care, also, to prepare a greater number of spiders in the cells destined to receive female eggs, than for male eggs, since the female wasps are larger than the males.

For at least twenty years I have practiced the replacing of drone comb by worker comb in the brood-chamber. It is an easy matter now, since we have the foundation; but before this invention I used to buy all the comb of dead colonies, at my neighbors'. The result was, that my colonies raised very few drones. Occasionally, and very exceptionally, a queen was found laying some drones in small cells; but certainly more than nineteen queens out of twenty did lay but very few drones in some occasional drone-cells; yet these queens did not seem dissatisfied with my depriving them of their option of laying drone-eggs. We have had a number of queens which did not lay 300 drone-eggs in their whole life; therefore it seems to me that a queen, in good health, lays drone-eggs in drone-cells because they are greater; and worker-eggs in worker-cells, because they are smaller; and that, if my queens had had the volition of laying drones, they would have laid drone-eggs in worker cells, as some did at times.

That the dimension of the cell has some influence on the sex of eggs is so generally admitted, that Mr. Cook himself, in his scientific bee-book, recommends, with all the bee-writers, to replace the drone comb in the brood-chamber with worker comb, "not to get myriads of those useless gormands."

If the queens, while laying, were moved by the desire to lay drones, as most writers pretend, our replacing of drone comb by worker-cells would be useless. As for the young queens, I have often noticed that, in the first weeks, some lay more or less drone-eggs in worker-cells; but I have, every time, noticed that these young queens were of small size, and that this irregularity disappeared as soon as they were fully developed. Therefore it was the size of these young queens, which, being too small for the size or the depth of the cells, had compelled them to lay drone-eggs. The worker-cells had acted on these small queens as the drone-cells do toward large queens. Then in this case also the sex was determined by the dimension of the cells, and not by the volition of the queens.

But there was a point which seemed to overthrow all these inferences. The combs of the wasps have all their cells of about the same dimensions; yet the mother-wasps raise males and females; then the dimension of the cells has no influence on wasps, and the difference of the sexes may be the result of the volition of the females. Such remarks, which came several times to my mind, were a cloud on the above theory, and Mr. Cook has just dispelled it.

The cells where the male wasps are raised are not provided with as many spiders, hence they are *not so full* as the cells where the females are raised. Are Messrs. Cook and Lubbock quite certain that such difference in the fullness of the cells, or in the length of the vacant space in the cells, is not the cause of the difference in the sex?

When the eggs of animals are mature they don't wait, but drop. Suppose that, when a mother-wasp prepares a cell to receive her egg, the weather ceases to be propitious for her hunt, or that the spiders are not easily found; the cell is provided with only half the spiders needed, yet the egg can not wait, and has to be laid on these scant provisions. Why not admit that such a condition of the laying does not afford impregnation, and that the result is a male wasp? Who could say that this theory is not as rational as the one which endows the mother-wasp with the knowledge of her future offspring, and of its comparatively smaller or greater needs? To sum up: As we can control the laying of our queen by replacing the drone combs with worker combs; as the young queens lay drone-eggs in worker-cells as long as they are undersized; as the conditions of the cells in which the female wasps

lay are different, and according to the sex produced; as no proof exists that any animal knows and determines in advance the sex of its offspring, I think that it is rational to conclude that the external conditions which are present at the laying of the queen have a positive influence on the sex produced. I should gladly see some discussion raised on this interesting topic. CHAS. DADANT.

Hamilton, Ill., Jan., 1886.

Friend Dadant, you really surprise me by the depth of reasoning you have given this very wonderful subject. You suggest many things that I hadn't thought of; and although I am left more in a maze than ever before, I think you have opened up a great field for investigation in a way it has never been opened before, to my knowledge. I know that removing drone comb is a great factor in preventing the production of useless drones; but it didn't occur to me before that this was a powerful argument in favor of the old Wagner theory — that the size of the cell might determine the sex of the offspring. I should be very glad to hear from Prof. Cook again after he has considered the facts you place before us.

VARIOUS MATTERS.

HOW MUCH PAIN IS THERE IN THE STING OF AN INSECT?

ON page 856 of GLEANINGS for Dec. 15, 1885, I see friend Root wishes to know more about the testing of the water in that well which gave an average temperature of 42°. I will tell you all I know about it. The man owning it is one of the oldest bee-keepers in our town; and as it is natural for the younger bee-keepers to visit the older ones, it so happened that I used to go often to see this man to talk bees, twelve to sixteen years ago. Being thirsty one hot day in July while there, I asked for a drink, and he went to the well and drew the "old oaken bucket" full of water, and handed me a glass of it. As I began to drink I stopped and spoke of its coldness, for it seemed to me equal in coldness to any ice water I had ever drank. He then spoke of the facts I gave on page 856; and to prove the matter to me he took a thermometer off a nail close by, which was showing some 93° in the shade, and placed it in the bucket of water, lowering the same into the well.

"Now," says he, "we will go in the bee-yard for a few minutes while the exact temperature is being registered in the well," which we did; and when we came back the thermometer showed between 42° and 43°. It was just such a thermometer as you sell on your 20-cent counter, and I supposed it was accurate. If I can think of it I will take my spirit thermometer along the next time I go that way, and make a further test of it.

HOW LONG A BEE LIVES AFTER STINGING.

By what I see in GLEANINGS I find an effort is being made to find out how long a bee lives after having left its sting; but so far I think the reports only point toward confinement being the cause of the death of the bee, rather than the loss of the sting. If a single bee is confined alone it will rarely live a great while; but if a dozen or two are put together with their queen they will live for a much longer time, but not so long as if they had their liberty. Now, I wish all the little folks (or big ones either) who try the experiment to see how long a bee lives after stinging, to put such a bee in with a dozen or two other bees which have a queen, and then tell us the result. While they are thus experimenting I will tell you what I know regarding the matter.

A year ago last August, while preparing a queen for shipment, one of the workers stung my fingers in getting it in the mailing-cage, which is a thing that happens occasionally with me; but always before this, and since, I have gotten them out of the cage, or secured them before they were in. But this bee was so spry that I could not get hold of it, and so I concluded to let it remain. This was at about 10 o'clock A. M. The caged queen and bees were left on my shop-bench all that afternoon, and till the next morning at 6 A. M. (or 20 hours), when the cage was wrapped and gotten ready for the seven-o'clock mail. At this time every bee in the cage was alive and smart, the one that left its sting in my finger being as lively as ever, as I could easily find it by the thread-like attachment which still hung to it. About this time I saw an account in the *Bee-Keepers' Magazine*, by J. Hasbrouck, if I mistake not the paper and the writer, telling of how a Syrian bee stung him, after which it was so persistent in trying to sting again that he caught it and put it in a cage with some other bees which he chanced to have caged. This bee he said lived a week when he let it have its liberty again. I may have made a mistake in some of the minor details, as I quote from memory. If Mr. Hasbrouck's eye meets this, will he not tell us all about it?

SMOKING BUMBLE-BEES AND HORNETS.

On page 636, R. Robinson speaks of "jugging" bumble-bees, and says that smoke "would do no good" in quieting them. The reason must have been that friend R. did not smoke them in their nest. Smoke does little or no good on cross honey-bees when they get in the air, and the same can be said of any kind of bees, hornets, or wasps; but take them in their nests, and a little smoke quiets them as effectually as need be; at least, such has been my experience with both bumble-bees and hornets. I have removed several objectionable bumble-bees' nests from about my premises by the use of smoke during the past ten years, and at one time I had quite an experience with a hornets' nest. This was about ten years ago, when I still managed the farm. One day I wished to sort some sheep, so I yarded them under a shed which I knew contained a large yellow-jackets' nest behind one of the braces. As I went in among the sheep I noticed the hornets thick about the nest, but thought they would not molest me; but as I reached out my hand to take hold of a sheep, one of them struck me, stinging at the same time, and, oh how it *did* hurt! I had got used to the sting of the bees, so it hurt me but very little; but this foreign poison affected me so I nearly fainted away, and I nearly lost the use of that hand and arm for four or five days, it was so swollen and inflamed. Well, I went to the shop, got the smoker, and after putting on veil and gloves I went cautiously to the nest, and before one was aware of aught save safety, I was pouring the smoke into the nest in a thick volume. The result was, that they began in a few moments to leave the nest, and, after hovering around for a few moments, they left, and I never saw one about

the nest afterward. I should judge there was nearly a pint of them, as it was a very large nest.

Borodino, N. Y. G. M. DOOLITTLE.

Friend D., I have all along had a notion in my head that I had seen bees in the hive with this thread-like appendage, indicating that they had lost their sting; and I shouldn't have been surprised had it been decided that they would live as long without a sting as with one. Perhaps the juveniles will need assistance from their fathers and mothers in making tests, by placing the stingless bee in a cage with some other bees. While shipping queens we can easily put in a bee or two destitute of stings, and then ask the recipient to report.—Your experience with hornet-stings is much like mine. One day I dropped a coal out of the smoker on my hand. Supposing, at first, it was a bee-sting I let it lie until I could conveniently remove it; but I mentally decided that the bee was stinging rather milder than usual. When I saw that it was a coal of fire that had burned a blister, I mentally noted down that I had, by accident, positive proof that the pain of a bee-sting is much more acute than the pain of leaving a burning coal on the bare flesh. But we are so used to bearing bee-stings with a martyr-like spirit that we hardly recognize how much fortitude it does require. While I am about it, it is my impression that there is more pain in a bee-sting than in having our flesh burned with fire, or cut with a surgeon's knife. By force of habit we shudder at the knife or fire, while we have learned to take the bee-sting as a matter of course. Well, I got stung by a yellow-jacket; and as I had been taking bee-stings as a matter of course, I perhaps took the yellow-jacket in the same way. But I was considerably surprised to find that it was a different kind of medicine, having a good deal more "pungency," as nearly as I can express it. I was prepared for the familiar sensation of a bee-sting, but not for the different sensation of a yellow-jacket, and therefore I made as much fuss about it as I used to when a boy in the huckleberry swamps.

HONEY IN PLACE OF SUGAR FOR MAKING CORN BREAD, ETC.

MRS. HARRISON OFFERS A RESOLUTION.

FRIEND ROOT:—While I was getting dinner I had a revelation; and with your permission I'll tell the women about it—the *men* needn't listen.

I was stirring up corn-bread, lick-at-a-cut, and I thought I'd put in a spoonful of sugar, to make it a little sweeter and richer, you know, when my eye rested on a bowlful of honey. The other fellow within said, "Why not put in a spoonful of honey?" Yes, why not? Mr. Muth produced evidence at the late convention at Detroit, proving that honey is sweeter than sugar and syrup, and why not use it? Worth more than sugar? Suppose it is; it takes time to sell honey and buy sugar, and why not use it and save tariff?

The new year is a general time of paying off old scores and making good resolutions, and I put this motion before the house:

Resolved, That we (honey-producers) boycott sugar and syrup of all kinds, as far as practicable, using, in their stead, honey, the purest of sweets, believing that this course, and this alone, will bring forth good to ourselves, and the land in which we dwell.

"What is sweeter than honey?" is an open question since the time of Samson, and is as yet unanswered. Bees lived upon it for thousands and thousands of years, and no complaints are recorded of its not being good enough, until the last decade. Now it is advocated to take away the honey from the bees, and give them sugar syrup instead, benefiting the sugar market to the detriment of honey. Are we going to teach the bees that their own production is not fit food for them, thereby imitating the wealthy manufacturers of oleomargarine, butterine, and glucose? No: if they can't live on their own production, let 'em die. Are we going to extract their honey, and go to the great labor of feeding back to them in return sugar syrup, and let the honey go begging for a market at four and five cents per pound? Not much, if the court knows herself."

Now let us feed our bees the dark, rich, good sweet honey, and not depress the market with it. What the bees can not consume, use in pickling meats, preserving fruits, making vinegar and ginger-snaps. Put it into the mince pies, doughnuts, bean-pot, where beans are baking, in lieu of molasses, and make it into taffy for the children.

Dr. Mason, of Ohio, had square blocks of candied honey at Detroit, that were far superior to any confectionery that I ever tasted. He gave me some, and I ate and ate, and I could not find a place to stop; and if I had not been taught manners when I was a child, I'd been eating yet. If I drank tea and coffee (but I don't, our water is so good) I'd sweeten some with it, and see if it would be bad to take.

It is a mistaken idea, that honey was given to us to ship by carloads to large cities. Stuck-up city folks don't even know it is there—don't see it; they telephone to their grocer for silver drips, honey-dew, and pure maple syrup from the woods of Vermont, while Chicago has a larger sugar camp than all New England.

Now let's have less of this foolishness; eat all we can, pay every debt we owe with it, make it legal tender; sweeten all our pet charities; the Christian home mission; foundlings' home, orphans' home, old-ladies' home, and, by all means, don't forget the shoe-blacks; see that your minister's table is well supplied; and if your doctor doesn't eat honey, don't take his pills any more. In England, sugar is so cheap they have been experimenting to see if it would not be economical food for stock; and isn't it worth our while to see if honey wouldn't be excellent food for the old cow? MRS. L. HARRISON.

Peoria, Ill.

Mrs. H., I second your motion; and if I were president I would ask all in favor to please say aye. As the price of honey now is getting so near the price of sugar, all that is needful is to decide that sealed honey is as wholesome as stores of pure sugar. Below we submit a paper from another friend who has got the same ideas in his head you have. He is a little more vehement about it than you are, it is true.—In regard to blocks of candied honey, if you were taking GLEANINGS so long ago you may remember that was once a big hobby of mine; but I got over it for the simple reason that nobody

seemed to care very much about it. There is another thing, too, you may not discover. Blue Eyes and her mother found out that these blocks of candied honey when melted made the nicest kind of confectionery. By all means, let us try to introduce honey everywhere, even to our domestic animals, as you suggest. Horses are fond of sweets, and a great many times it seems to encourage them to give them a lick of sugar. Now, wouldn't a lick of honey help them to take an interest in our plans and our work in the same way?

SUGAR SYRUP FOR WINTER STORES.

IS IT ADVISABLE, ALL THINGS CONSIDERED?

FRIEND ROOT, do you know that we are building up the sugar-trade at the expense of the honey-producers of this country? The universal law is, to provide first for our own house, and then, if we have any thing to give, we can help the sugar-men. We blame the newspaper men for saying that we feed the bees sugar syrup, and then sell it for honey. I for one don't see how they can very well help saying what they do, as long as all of the bee-journals and leading bee-men advocate the feeding of sugar syrup. I wish I could tell how many times in the last year you have said, in your foot-notes, "Feed sugar syrup." It is very embarrassing to me when I go to the city to sell honey, and begin to show my samples, to have the merchant look up, with significant grin, and ask me what I fed my bees. I have 1400 lbs. of nice white comb honey that I have been unable to sell. Our home market is glutted with honey; and the worst of it is, that it was sold for less than the best grades of sugar bring. I for one have fed the last pound of sugar, unless necessity compels me to. If my bees run short next spring I shall feed section honey before I buy sugar. My experience is, that bees fed well-ripened honey will winter just as well as those fed on sugar. Bees fed on honey last fall (1884) wintered much better than those not fed. I have fed some colonies this fall on a poor quality of last year's honey, and we shall see how they tally in the spring.

Friend Root, you remember that a few years ago you rode the grape-sugar hobby until your hobby was besieged and demolished by solid facts; and the sooner your granulated-sugar hobby suffers the same fate, the better it will be for the bee-keepers of the country. If the hundreds of thousands of pounds of sugar fed to the bees were left where it belongs, and the bees were fed on honey, the market would not be glutted, and we should get a fair price for our honey, and there would be a call for it. A man not far from here fed sugar syrup this fall to get partly filled sections filled out, and then sold it for honey. It isn't all gold that glitters. Some bee-keepers have got it in 'em bigger than a woodchuck. Unless there is a change in the administration in bee affairs, I am going to go it on back numbers, and let GLEANINGS live on carp.

You remember how you mourned over the wreck of your grape-sugar hobby, and there is one thing certain—that sugar feeding or bee-keeping has got to go down. Are you aware that the best grades of extracted honey don't net the producer as much as we have to pay for the poorest sugar? and then feed sugar? Never—no, sir; I'll let 'em die first.

Give my best wishes to Ernest. I wish him Godspeed. 9—GEO. A. WRIGHT, 55—95.

Glenwood, Pa., Jan. 15, 1886.

"SUCCESS IN BEE CULTURE."

PROF. COOK'S OPINION OF HEDDON'S NEW BOOK.

EDITOR GLEANINGS:—I know you too well to even doubt but that you, like myself, will believe and read with great pleasure and satisfaction this *brochure* from our friend Heddon. From the very nature of the case, my book gives prominence to the scientific aspect of bee-keeping, and to such practical questions as are more closely related to general science. You, as an editor and dealer, have ready access to the people, and know just what they are feeling after, and must constantly be working to give them better and cheaper implements, and so the A B C has its special mission. But our friend Heddon, as a large and experienced producer, is emphatically a practical man, and is dead in earnest in his search for better and cheaper methods. As one of our ablest, most successful, most studious bee-keepers, we all expected his book to be replete with valuable facts and suggestions, and we are not disappointed.

My brother said to me the other day, just after completing the reading of this book, "I have received a large number of valuable hints, and some way they are so in the line of my own experience that I feel certain they will prove practical and very valuable." I have read the work with great care, and I feel that no wide-awake apiarist can spend 50 cts. more profitably than in securing this book, and so I am prompted to write this notice.

The general appearance and mechanical part of the work, and especially the clear, terse, and forcible descriptions, will meet no criticism from the intelligent, practical bee-keeper. The first part of the book is not greatly different from like portions of other similar works. Mr. Heddon and his anonymous "friend" explain what actual experience proves most valuable with them, and do not obscure and puzzle with descriptions of many things and methods. While this plan has much to commend it, we must still remember that this is a great country; and in so intricate an industry as bee-keeping, what is admirable in one location may be worthless in another. This caution is, however, repeatedly urged in the work.

We are specially interested in the chapter on hives, and the explanations in regard to the securing of comb honey. The former has been a matter of long and earnest study with the author, and his success in the latter makes him an authority. Surely no one will say that his hive, his method, or his manipulation is copied. For the past two years I have been experimenting with this reversing business, and am fully convinced of its excellence; and though I had no time to plan or speculate on a reversible hive, I had expressed the opinion and belief that it was a desirable implement, and sure to come. I have little doubt but that Mr. Heddon has given us a desirable improvement, and I shall try it the coming season with full assurance of success, and of improving old styles and methods. The contracting of the brood-chamber at times, I know to be very valuable. This ready means of its accom-

plishment will commend itself to those who have studied and thought in this direction. The honey-board and bee-spaces, no one will abandon who has given it a fair trial. With the ease of reversion and contraction, the bee-spaces and honey-board, and ability to at once invert sections, we have comb-honey production reduced to a science.

There are, however, some things to criticise. We did hope our friend would outgrow his morbid notions about "swelling our ranks," and "specialists," before he wrote this valuable work. We are sure the increase of demand has more than exceeded the increase of supply. Wife tells me, that during the war she paid 60 cents for very poor cotton cloth, while the best sells to-day for 7 cts. In 1870 the same cloth was 18 cts. per yard by the bolt. Since I have kept house, fifteen years, sugar has declined more than one-half. Thus honey is no exception; and does not Mr. Heddon and everybody know that high prices make brisk trade and eager buyers? True, people did run after honey fifteen years ago, and so did they after fruit and all commodities. Do they to-day? As long as I know of scores of amateur bee-keepers who are securing pleasure, health, and profit, from their bees, I shall still take issue with my friend.

There are a few minor points, like function of drones, stimulative feeding, etc., that I feel to criticise; but on the whole the book is admirable, and should, and I trust will, be at once in the hands of every enterprising bee-keeper in the land.

Agricultural College, Mich. A. J. COOK.

I believe, friend Cook, I can stand with you in every thing you have said. Every bee-keeper who wants to be up with the times should read Heddon's new book.

"SUCCESS IN BEE CULTURE."

FRIEND ROOT'S CRITICISMS.

AFTER what we have heard from others regarding our little book and the new system of management for comb honey, and new hive adapted thereto, your remarks on page 45 may have a wholesome tendency to prevent our becoming vain. I suppose we are all fond of praise. I believe we all ought to be. I hope never to sink so low as not to feel a thrill of pleasure when receiving that praise which I have endeavored to merit.

Or who would even care to do brave deed,
Or strive in virtue, others to excel,
If none should yield him his deserved meed,
Due praise, that is the spur of doing well?
For if good were not praised more than ill,
None would choose goodness of his own free will.

I believe it is neither honest nor wise for us to feign indifference to the good opinion of others, or their candor in expressing that good opinion. I believe with the poet Young, that,

The love of praise, howe'er concealed by art,
Reigns, more or less, and glows in every heart;
The proud, to gain it, toils on toils endure;
The modest shun it but to make it sure.

Still, we do not expect praise from every one. I do not now call to mind the history of any person who did, or even endeavored to bring about any reform, either in social, moral, or business life, but that made opposers, and sometimes enemies thereby. Greville tells us that "those men who are commended by everybody must be very extraordinary men; or, what is more probable, very inconsiderable men."

The above is not said with a belief that in your remarks on page 45 you endeavor to "damn with faint praise," as Pope says; yet after we have endeavored to present the best we know, both in mechanical construction and manipulation in the apiary, looking from our standpoint it seems as if you had misconceived something in your forced, hasty review of the book and new hive; and as these subjects are just now greatly interesting many readers, and have been paramount with me for more than a year, I ask for space for a fair and candid explanation.

I appreciate your sympathy regarding the trouble we have with the engravers, and thank you for your words of praise for the author, and am glad you did not say the book was not worth the price asked. I have seen many essays upon apiculture, that I considered worthless to any one, and worse than worthless to many; but I never saw a book devoted to our business that was not worth many times more than the price asked.

You say you "think the book should be read in connection with other works," and give your reasons for so believing, both of which are entirely correct; and I thank you for the reasons given, than which nothing more commendatory need be said on that point. You say, that to you the main feature of the work is the new hive. Were the book handed to me a stranger, I should look at it just as you do; 18 of the 228 pages are devoted to that subject; and if any reader should infer by your remark that the book was a part of the new hive, rather than a description of the new hive being a part of the book, I would call attention to father Langstroth's work, and the further fact of the proportion of importance of the hive as compared to all else related to bee culture.

You next say the new hive is to throw the old one (*i. e.*, our modification of the Langstroth) entirely aside. If you mean in principle, that is just the way it looks to me; but if you mean that sentence to be taken literally, in its broadest and most extravagant sense, for the benefit of some of your readers, please allow me room to explain. I have tried to exercise care not to say any thing that might lead any bee-keeper astray.

It is not human to be always right; and whatever I may have said that tended to lessen the income of any bee-keeper I deeply regret, and assure you that my intention was exactly the reverse.

I do *not* advise any one to exchange a good hive for a better one, in a rash and hasty manner. But few of my present 450 colonies are in the new hive, and I shall make the change only as fast as economy will warrant. My thousands of straight all-worker combs in reversible L. frames will not be sacrificed. This thought should have been in the book; but we shall be thankful that our journals may supplement our books, as my little work is intended to supplement the more comprehensive works of others. Is it strange that the little "Success," like its author, should be a specialist?

You speak of your thoughts of years ago of a case without frames, with top and bottom bars for many of the purposes of my new hive. These same thoughts I entertained during the evolution of the new hive; but I found that, to make the system complete in *all* cases, the combs should be movable.

You say it is a little amusing to see me go back

and declare in favor of wide frames and separators. That statement amuses me. I presume you have been too very busy to have noticed that in my writings for papers I have favored them some two or three years when used one story, upon the tiering-up plan. I was driven from their use, as well as the hundreds who went with me, from our experience with them in two-story supers. I was led to the use of them again some four years ago through the solicitations of Mr. Oatman, and announced my success and pleasure with them as fast as experienced. I must change every week, if 'tis necessary to progression; but I think you have covered me over a little too deep in this instance. You did not mention the peculiar features adapting the horizontal parts to reversing in two different ways. One, by having a half bee-space on either side of the frames in each case and the honey-board, and of having all of the bee-space on one side, pushing the frames through at each reversion.

Yes, this shallow hive is not only "splendid for shipping bees," but owing to its depth, weight, character, and fixedness of the combs and the cases, it is splendid to move anywhere about the apiary, or in a repository, as well as to the railroad station. I now come to your objection to the tiers of series of shallow combs; and I must say that I can not believe that you have had experience upon this point. From the standpoint of my experience, it astonishes me that any one should think that queens will not breed rapidly in shallow combs. I feel sure that this is the echo of the same frightened tones that were loudly heard when father Langstroth took his grand step from box hives 18 inches tall to his "dangerous shallow hive." You speak of "less than 5 inches of comb depth." My combs are only ⅛ inch less, and my experience has firmly convinced me that I can take two tiers of combs, no more than three or four inches deep, and all of 24 to 30 inches long (to get capacity), arranged with the "sticks and spaces" as mine are, and, by the *interchanging*, can encourage breeding faster, with less expense, than can be produced in any other way with any depth of combs; or I will just let the two cases alone, and agree to equal in brood any other form of hive, all other influences being the same. We know this by hundreds of experiments; and friend Bingham, withh is 25 years' experience with colonies, in hives containing eight combs 4½ inches deep and 22 inches long, believes that, in these combs, brood is produced faster than in any other form.

I have used one of his hives eight years; and as far as my observation goes, on the one hive, I would say the shallower the better, for brooding.

Do you forget how our queens often produce twice the brood in two or three tiers of L. frames (passing honey-boards and perforated bottoms) that they will in one tier, even though that one be large enough to hold all the brood, if it were all concentrated?

Do you forget the rousing swarms from old box hives full of cross-sticks, with the combs all in jags and pieces, which have oft and repeatedly been praised for the winter passages they create? You did not mention the adaptability to contraction, so highly prized by friends Hutchinson, Doolittle, and others, bringing out the fact that only one section or brood-case is used during the greater part of the year.

A WORD ABOUT MY PATENT.

Regarding the originality of my invention, you have spoken quite correctly in one sense, yet I fear you have left a wrong impression. I knew that closed-end frames were old; also that, though I was an original inventor of screws for tightening frames, others were original in the idea before me, and that it is not patentable.

I am also aware that I am not original in using frames around bee comb, nor of honey-boards of some kind, nor of using wood for bee-hives. I don't believe there is a man in the world bright enough to make an improvement in hives, harvesters, sewing-machines, watches, and, I might say, nearly every useful article known to man, without using old parts mainly. If he has one new feature, or a valuable combination of old ones that will carry into effect a new and useful system, he does well, and at once commands my respect, and the earnest attention of the Patent Office. All, yourself among the number, have credited to me a new and original system of management, and the new hive is a peculiar combination of parts and principles intended to be best adapted to working that system, and that combination is what we have endeavored to secure by letters-patent. If the new hive and peculiar system of management are worthless, a patent can do no harm; if useful, should I have no part of the value thereof? In my chapter on patents I endeavored to make these points clear. If my reasoning is unsound, I should thank you for correction. If I have not already given enough of value to the public to amount to my full share in the line of presents, I here ask you to publicly tell me so.

I shall be pleased to send you a complete hive, and enjoy seeing some accurate illustrations of it. Wouldn't it be well to allow me or friend Hutchinson to explain its workings, and the system of management adapted to it, we and my students being the only ones who have passed it through the crucible of practical experiment?

Dowagiac, Mich. JAMES HEDDON.

Friend H., I shall be very glad to have you write an explanation to the engravings after I have had them made; in fact, I greatly prefer you should do so, as I, of course, have had no experience as yet in using such a hive with bees in it.

THE STINGLESS BEES OF MEXICO.

THEIR MANDIBLES A MEANS OF DEFENSE.

I THOUGHT it might not be uninteresting to your many readers to have a short story concerning the little stingless bee of Mexico; and if you will bear with me I will tell you what I have learned through the many travelers whom I have seen and conversed with on this to me very interesting subject. I have a brother who sojourned in the sunny clime of the State of Sinaloa for a little more than one year. He says they are very numerous. He says he was out in the woods shooting birds, called by the natives chichilacs (a bird something like the guinea in size and habits), and when they had fired their guns off, and were reloading, his companion said to him, "When we get our guns loaded we will have a bait of honey."

My brother was surprised, for he had not, during all his stay in that country, seen either bees or honey; but when their guns were reloaded his companion looked him straight in the face, and, smiling,

kicked a small chunk of wood with the toe of his boot, and, bursting it open (it being hollow), to his surprise it contained between one and two quarts of the most beautiful and delicious honey it had ever been his good fortune to see and taste. The honey was stored in combs constructed of wax, and were in every particular just like the combs of our honey-bees, except the cells were very small. He describes the bees as being not larger than common house-flies, and marked something like yellow-jackets.

After having once seen the bees, he had no difficulty in finding more than 100 swarms during that day. He says he counted 25 swarms in the hollow roots of one wild fig-tree. Afterward he often enjoyed the luxury of eating the honey stored by these interesting and wonderful little bees. Other travelers give a similar history; and all say, that, though the bees are stingless, they are not left without courage and means of defense. Their mandibles being sharp they can bite in a manner that is "more forcible than pleasant."

The Mexicans, who live in our town, often talk to me about the *colmanus* (pronounced *cole-mah-noos*), as they are called in the Mexican vernacular. They say they are "*muybrava*;" that is, they are very brave. I hope ere long to be enabled to visit that country, and study the habits of that wonderful little insect.

Tempe, A. T., Jan. 11, 1886. JOHN L. GREGG.

Friend G., we are very much obliged indeed for the very valuable information that you give in regard to these little bees that don't sting; and we place $10.00 to your credit for the article, to help enable you to make further researches in this matter. The same bee, if I am correct, has been tried here in our northern climate, but they don't seem to stand the winter. Do you think the honey would sell in our markets—that is, does it compare favorably with the honey of our native bees? Do you think they would work in movable frames? Perhaps the matter can be tested better in their native clime, and I will willingly pay you for the time and trouble required to test the matter, if you are willing to undertake it. If your brother had no difficulty in finding more than a hundred swarms during that day, it seems to me that locality must have been a wonderful field for modern bee culture. If you could send us a piece of the comb by mail we should be very much obliged indeed. May be you can send us some bees in a queen-cage, either dead or alive.

FEEDING BACK NOT PROFITABLE, AND WHY.

FEEDING 3500 LBS. OF EXTRACTED HONEY TO GET IT INTO SECTIONS.

ON turning to page 443, GLEANINGS for July 1, 1885, we find a communication regarding the feeding-back of extracted honey for producing comb honey. Bro. Hutchinson seems to advise the use of separators, and announces that the bees will otherwise even bulge the combs, and build projections and little mounds upon the surface of the combs. He has also met some incidental troubles in feeding back for sections. I have had some three seasons of experience in this feeding-back business, but more extensively the past season. We would say that no separators were in use, and never have our bees produced a finer lot of comb honey than was the one produced by this feeding-back method during the past season. The combs were bright and clean; the sections were filled. There was a few sections which were very slightly bulged. There was not one mound or projection, to our knowledge, upon the surface of any of the combs. We shall be glad to give you our opinion as to why feeding back is unprofitable. Here is the whole business: Twenty of our strongest colonies were selected for this feeding-back purpose. The 20 colonies would not have exceeded 200 lbs., or an average of 10 lbs. per colony to each brood department at the commencement of feeding back, which was comparatively near at hand, Aug. 17, 1885. Many large feeders were made, holding 25 lbs. each. Two sets of sections were placed on each hive, and no more. To the above 20 colonies was fed 3500 lbs. of extracted honey, or an average of 175 lbs. per colony, in 35 days. The total amount of comb honey received from the 3500 lbs. was only 1250 lbs., or 62½ lbs. per colony all in one-pound sections. The total amount for the 20 brood departments was 800 lbs., or 600 lbs. of the 3500 lbs. of extracted honey stored in the 20 hives. Thus the consumption for the 20 colonies in the secretion, or forming of wax scales, and for brood-rearing, evaporation, etc., is that enormous total of 1650 lbs., or 82½ lbs. per colony. To some of these colonies was fed perhaps nearly 150 lbs., ere the first 54 sections were ready to come off. Only they who have tried this experiment know what difficulties one must encounter by turns, the scores of exasperating stings, and the imperious robbers, with their exciting movements and the taking off and refilling of each feeder. All this is certainly enough to disgust one in feeding, to say nothing regarding the loss in the operation. The increase on these 20 colonies is nearly 100 per cent; and as they were used mainly for building up late colonies, this is quite an item.

A. F. UNTERKIRCHER.

Manchester, Mich., Jan. 8, 1885.

Friend U., you have given us the report of a very valuable experiment indeed; but, why take so many colonies? You will see by the experiments I give in the A B C book, that much of the honey will be saved by making two or three of the colonies do the work. Perhaps, however, this would have been impossible with so large an amount as you had to feed back. And, by the way, the results of your experiment will be a good fact to furnish the newspapers that are accusing us of feeding cheap syrups and calling it honey. Counting time and all, it probably will never pay anybody to feed sugar, even if it would make nice honey, and I very much doubt if it ever has been done to any extent worth mentioning. I have noticed exactly what you say about robbers' exasperating stings, and the unnatural aspect of affairs induced by this kind of wholesale feeding. It seems to me I never in my life encountered any stinging, or any thing about bees, so terribly ugly as when feeding to get sections filled. The bees themselves seem worried and unnatural; and if the weather is very warm, it seems just about out of the question to do any thing about keeping robbers from pushing their way into the entrances of these hives containing large feeders.

THE FIRM OF JANE MEEK & BROTHER.

A Serial Story in Ten Chapters.

BY REV. W. D. RALSTON.

CHAPTER II.

FAMILY TALKS ON BEES.

THE morning after the bees had been removed to the parsonage, Mr. Meek called Jane and Tommy into his study for a talk.

"Now," says he, "you have bees to care for; but, what do you know about bees? Tommy, you may answer first."

"Well," says Tommy, "bees are living things. I think they are called insects, but I am not sure. A great pile of them live together in a box, or nail-keg, or, when wild, in the woods they live in hollow trees. They make honey and wax, and sometimes sting people. Jimmy Brown told me that in every hive there is a king-bee, a great big long bee, that bosses the other bees, and makes them do just as he wants. I guess that is all I know about them; only that those who keep bees manage in some way to get honey from them. Some people kill the bees with brimstone, as Mr. Brown was intending to do with ours, and thus get their honey; but other people can get their honey without killing the bees. I do not know how they do this; but I want to learn, because I do not want to kill a single bee if I can help it."

Mr. Meek then asked Jane to tell what she knew. She replied, "I know very little more than Tommy has told you. I am sure bees are insects. Early this morning I went out to look at our hive. I found two bees dead before the entrance. I brought them into the house, and looked at them through our magnifying-glass. My teacher says, 'Insect means, to cut into, and is applied to certain living things because they seem to be nearly cut in two.' I saw that the heads of those bees seemed almost cut off; and back of where their wings are joined to their bodies, they are almost cut in two again; so I feel certain they are insects. I also learned in some place, that it is not true that bees have a *king*, but they *do* have a *queen*. She is the only truly female bee in the colony. She does not boss the other bees, but merely does her part in the colony, which is to lay all the eggs that are laid. Then I do not think bees make honey; God makes it come in flowers, and the bees only gather it. I also know that bees swarm; when there are too many bees in a hive they divide, and part go out to form a new colony. When they come out they fly around for a time, and then gather in a bunch on some tree or limb, where they look like a large ball. If their keeper sees them come out, and puts them in a hive, they are likely to stay; but still, sometimes they leave his hive, and go to the woods. If he does not see them they will remain for a time on the limb, or wherever clustered, and then depart to the woods. That, I guess, is all I know about bees; but I should like to learn more about them."

Mr. Meek laughed a little as he replied, "I see you know as much about bees already as many men do who have kept bees for years; but there is still much for you to learn. If a man wants to raise horses successfully, he must study about horses; if he raises hogs he must understand them; and I assure you that no man can manage bees successfully unless he understands them. I want you to learn what you can about bees before next spring. Many years ago I read about a minister named L. L. Langstroth, who had studied much about bees, and who had written a book on the subject. I bought his book, and was well pleased with it. Here it is, and I want you both to read it carefully. For two years I took a farmers' magazine which came once a month. I noticed in each number a page or two devoted to bee culture. I carefully preserved all the numbers; here they are. I want you to hunt up in each one the pages on bee-keeping, and read them carefully, and bring to me any thing either in the book or papers you do not understand, and perhaps I can explain it to you."

The children gladly accepted the book and magazines, and began to peruse them. For a time, at least, much of the talk at the minister's table, when strangers were not present, was on bees and honey. We might for a little listen to some of their talks.

Mr. Meek said, "Well, children, what about bees to-day?" Jane replied, "In reading I find the word *apiary* very often; but I do not know what it means."

Mr. Meek replied, "*Apis* is the Latin name for bee; apiary means a bee-yard, and comes from that word."

Tommy asked, "Is our yard an apiary?"

His father replied, "I think hardly. If we should call a single colony, and that a weak one in an old nail-keg, an apiary, we should be putting on too much style. But I hope, if our bees live, to see you and Jane owning enough colonies to call our yard an apiary."

Jane asked, "If our bees increase until we have a great many colonies, perhaps fifty or one hundred, will they all belong to Tommy and me?"

Her father replied, "Yes, certainly; Mr. Brown gave them to you and Tommy, and I intend that you shall keep them and all their increase. My reason is, I want to teach you to work for yourselves. In a few years, almost before you know it, you will have grown up, and will have to work for yourselves; so I want you to commence now, and learn how to work and do business for yourselves. As you are going to do business, you need a book to record the business you do. Here is a small blank-book which I do not need. It will answer for the present, and I want you to record in it every item of expense and income. You will own these bees together; that is, you two will be a firm, or company, doing business together. Now, by what name shall this firm be called? The large brick store in town has on it, John Morgan & Brother, which means that John Morgan and his brother Samuel are a firm doing business together. Just so, Jane and Tommy Meek is a firm now formed to do business in bees and honey; and what shall we call this firm?

Tommy replied, "Call it the firm of Jane Meek & Brother."

Mr. Meek wondered that he did not say the firm of Tommy Meek & Sister, which is what many boys would have said. Taking a pen, he wrote in the back of the blank-book, in a large hand,—

ACCOUNT-BOOK
OF
THE FIRM OF
JANE MEEK & BROTHER.

He then said, "Now that the name is settled, tell me what you are learning from reading the book and papers."

Jane answered, "We are learning many wonderful things, things I never should have thought of

unless I read them. Bees are very strange insects, and do some strange things. In May, June, or July there are often forty thousand bees in a hive. Just think of it—*forty thousand!* But there are not so many during fall and winter; and in the spring some colonies have very few."

"Yes," says her father, "sometimes colonies have not a single bee in the spring. They continue to grow fewer in number, until there are none at all. Tommy, have you learned how many kinds of bees are in a hive?"

"Yes, sir, there are three kinds—the queen, a large long bee; the drones, large bees, but not long like the queen; and the worker, the small busy little fellow that gathers the honey and stings people. The queen has a sting, but does not sting people. When she meets another queen she fights with and stings her. The drones have no stings. You can catch one and handle it as you would a fly. I should like a colony all drones, then I should not be afraid to work with it."

"But, Tommy," replied his father, "I fear it would be a very unprofitable colony. A man, who commenced farming, wishing to raise turkeys, bought a pair from a farmer. It being late in the spring, the farmer asked more for hens than gobblers; and the buyer, seeing that the gobblers were much larger than the hens, took a pair of gobblers, but failed to find any turkey-eggs that summer. The drones are the males among bees. They are found in the hives only during the honey season. At the close of the honey season the worker-bees kill them."

Jane said, "I have learned that the most important bee in the hive is the queen, or the mother, as she might be called. She lays all the eggs. She lays eggs very rapidly, laying three or four a minute, sometimes three or four thousand a day. But she never lays very many eggs unless the bees are bringing in plenty of honey. In the cold winter months she lays hardly any. Every bee has its work to do. Some build the combs, others fly in the fields, searching for honey or pollen, others are nurses, and care for the young, while some stand as guards around the entrance."

"But," says Mr. Meek, "did you learn from the books how to winter bees?"

"Yes," said both children, "we read about it;" "but," said Jane, "I hardly know what is best. Some people carry their bees into nice warm cellars, where they are kept snug and warm all winter; still, some who do so lose their bees. Others leave their hives out unprotected all winter, standing just where they did during the summer; and, what seems very strange, sometimes their bees winter better than in cellars. This, in the papers, is called wintering unprotected, upon their summer stands. Some winter by leaving their hives upon their summer stands, and packing straw and hay around them to protect them from the cold; others write frequently about wintering in chaff hives; but I do not know what kind of a hive a chaff hive is."

Her father said, "I now remember that once when away from home I saw several very large-looking hives; and on inquiry I learned that they were chaff hives. I inquired how they were made, and was told that they consisted of two distinct hives, with a space between, which was filled with chaff, packed in closely, thus keeping the inside hive from the frosty air, and keeping it warm."

Here Tommy expressed his opinion that their bees would winter best in their nice warm cellar, adding that he had been reading that those in the cellar wintered on much less honey than those exposed to the cold. His father also favored wintering them in the cellar, but advised letting them remain on their stands until winter had set in, and until it seemed evident that the pleasant autumn weather was ended. He said it did bees good to have flights during winter, and that was why those left on their summer stands sometimes wintered better than those in the cellar. In winter they have flights occasionally, while the lack of those flights causes those in the cellar to become diseased.

Jane said, "I am glad our bees will be in the cellar during the cold stormy weather. I do not think I could sleep, cold winter nights, when the wind is driving the snow, and the thermometer is at zero, if our bees were out in the cold. Our horse has a warm stable, so has our cow. The chickens have a warm comfortable coop, and even our pig rejoices in good quarters. Why, then, should we leave our bees out in the cold?"

"But," says her father, "you forget, Jane, that all bees are in a house. Their hives are their houses."

"But, pa," said Jane, "I think an old nail-keg is not much of a house."

To be continued March 1, 1886.

THE SOLAR WAX-EXTRACTOR.

MORE SUGGESTIONS REGARDING IT.

I DO not know whether or not I can add any thing useful to the question regarding the solar wax-extractor, which seems now to be prominent, but I will give my experience in this direction, and some suggestions.

I made a solar wax-extractor the past season from the plan furnished by Mr. Poppleton, with some modifications. My box is 28×42 inches, outside measure, and 12 in. deep, with straight instead of zigzag bottom. The tray is made of wood, with a rim extending 1½ inches above its surface, except at the spout where the wax runs off. This is sheathed with tin, and is made just wide enough to slip inside the box. It carries its width for 20 in., when it slopes for about 14 in., a space of 6 in. being left for the wax to flow off.

It is covered with double glass, composed of 4 sheets 20×26 in. The tray is hinged near the back end by a couple of short pieces of stout wire run through the sides of the box into its edges. This admits of the front end of the tray being raised to lift the pail, which holds the wax, in and out.

This tray is large enough to hold the cappings of a day's extracting. Having drained during the night, they are put into the extractor the first thing in the morning; and if the sun is ordinarily strong they are melted before night. The wax is left in the pail till the next morning, when it will be found in a solid cake, floating on the honey which has run off with it from the cappings.

I purpose making some changes in my extractor, which I think will improve its workings. The sides of the box cast a shadow on the wax for several hours in the morning and afternoon, unless it is shifted about to face the sun as it advances. To do this the more readily, I intend to fix it on a frame made to revolve on a pivot. I find, moreover, that my extractor develops heat enough to scorch the honey which goes off with the wax, so that it is

nearly spoiled, even for second-class honey. Perhaps perforated tin, as it is used in the extractor described by Mr. Muth-Rasmussen, on page 359 of GLEANINGS for 1885, would remedy this evil. The capacity of the tray might also be increased by having its width uniform, and having a gutter to catch the melted wax, this gutter having a slight fall from each end to the center, where a hole in it would permit the wax to fall into a pail.

Further improvements might be made by having the legs which support the end of the extractor fixed with a thumbscrew so that it could be supported at any height. A similar arrangement attached to the hinged end of the tray might correspondingly regulate its incline. Thus the position of the glass might be readily changed so that the sun could strike it at right angles at all times. As there are days nearly up to November when the extractor may be used, this is a matter of importance.

With these suggested changes I think that the convenience and efficiency of the sun wax-extractor, as I have used it the past season, would be greatly increased. Mine, as it is, I consider one of the most useful things which I have about my apiary, and I would not be without it for twenty times its cost. Heretofore the storage of cappings, till I had time to render them, was fraught with vexation. They would drip, drip, no matter how well they might be drained; and unless a tin receptacle were used, I would soon be reminded of the searching and sticky qualities of honey by finding a strain of it making its way over the floor from under my barrel of cappings. But there is no vexation of this sort now, and I thank Mr. Poppleton for his plain directions which led me to make a solar wax-extractor. JAMES MCNEILL.

Hudson, N. Y., Jan. 16, 1886.

Friend M., there is a simpler way of getting the sun's rays in the morning and evening than having your box on pivots so it must be turned. Use three or more panes of glass. Have one side at an angle southeast; the middle one at an angle facing the south, and the third at an angle facing the south-west. Or, to get a more perfect arrangement still, use a bell glass in the shape of a rounded comb or pyramid. I am astonished to know that the heat of the sun could injure the flavor of the honey. Some arrangement to let it run off before it is so hot would surely remedy this. In regard to having drippings or cappings, or any thing else, running down on to the floor, I would not have any such work about me. If those who help about the apiary can't be cured of such tricks, I would swap them off for somebody who *could* be cured.

A REPORT FROM TEXAS.

SWARMING-OUT OF NUCLEI.

I TOOK two colonies on shares three years ago last spring. I now have 35. I increased mostly by artificial swarming. I believe it is the best way, unless one could be in his apiary all the time during the swarming season. I made 7 artificial colonies this last summer, every one of which swarmed when the first queen hatched out. This is something I never knew before. I thought at first it was on account of their not having any unsealed brood. I gave them young brood and larvæ, but it did no good—they swarmed all the same. Of course, if I had given them a laying queen when the colonies were first formed, the trouble would have been over. One colony I gave a laying queen when formed, and I took over 100 lbs. of honey from it. The others all swarmed, and filled their hives, but made but little surplus.

EIGHT DEGREES ABOVE ZERO, IN TEXAS.

We are having cold weather here now—eight degrees above zero, which is uncommonly cold for this country.

COMBS BREAKING DOWN BY FREEZING.

I noticed this morning, while looking through my bees, that the honey was running out at the entrance of several of the hives; and on examination I found that the combs in the outside frames were cracked, and the honey oozing out. This is something else I never saw before. I've seen combs melt down in all kinds of hives, but I never saw them *freeze* down before.

DANGER OF LEAVING AN UPPER STORY ON DURING WINTER.

I have lost one colony this winter. It was a strong one, but I had left the upper story on, and they went above and starved to death, with at least 40 lbs. of nice honey in the lower story. Every frame in the lower story is solid sealed honey. So you see the loss of this colony is attributable to my neglect, for I know very well that bees could not winter, even in this climate, on all sealed honey. This is a good country for bees. We have a great variety of honey-producing plants. The horsemint is the best honey-plant we have here. A good many people keep bees here, but there are very few who take any pains with them. Most of them hive them when they swarm, set them in a fence-corner, and that is the last of them until robbing-time.

J. W. THOMPSON.

Decatur, Wise Co., Texas., Jan. 19, 1886.

Friend T., it is certainly very unusual for the bees of a nucleus to go out with the young queen, when they have brood in all stages in the hive. Of course, a laying queen would set things so much ahead.—One hundred pounds of honey from an artificial colony is pretty well, for a beginner. I think your locality must be a good one.—Eight degrees above zero is certainly colder than I supposed it ever was in Texas. No wonder your combs broke and let the honey run out. A chaff hive would effectually remedy all such troubles, and I should most assuredly recommend chaff hives in Texas, if you are going to have a repetition of the temperature mentioned above.—Bees are always liable to go into the upper story where it is left on all winter, because the warmth from their bodies rises naturally, and they follow in their efforts to cluster in the warmest place in the hive. Here is where the advantage of the Hill device comes in. It makes a cavity covered on all sides by the chaff cushion. Now, this chaff cushion allows air to pass through fast enough to keep it always pure, and at the same time it holds it long enough so the heat of the hive may accumulate in this cavity, inducing the bees to cluster right there, with their stores of honey so near them that they are always able to reach it.

HEADS OF GRAIN
FROM DIFFERENT FIELDS.

ROAD DUST AS POLLEN.

BEES do actually gather dirt for food. Here is what I copy from my "Bee-Book of Items," dated April 13, 1884.

"Bees are working lively to-day, and yesterday, after a confinement of a week of cool weather. They are carrying in water and dust from the road."

I never saw bees gather dirt but this once, and perhaps it was a week that they worked on it. They packed it just the same as they do pollen. It was on account of frost and strong winds destroying the pollen from the trees that had been yielding pollen before, and, of course, they quit the dirt as soon as they could gather elsewhere. I offer this in reply to you on page 10, Jan. 1. Bees seem to be wintering well so far, as we have had a very mild winter up to date. JOHN A. THORNTON, 73—108.

Lima, Ill., Jan. 7, 1886.

CAN POLLEN BE ARTIFICIALLY REMOVED FROM CELLS?

Please tell us if there is any convenient way of extracting pollen from old combs. Last summer I filled my hives with combs where bees had died the previous winter, and there was a large amount of pollen in them. Will it prevent the queen laying—that is, will the bees clean the cells in the brood-nest, to make room for the queen to deposit her eggs? or, should such combs be taken from them next summer, and others supplied with foundation be put in their place? Is it certain that they use much pollen through the winter, if they have a plenty of honey? Is it right to cut out all the drone comb in the spring, and keep it out of colonies that you do not wish to breed from? These are questions that I don't recollect seeing answered in the A B C.

La Otto, Noble Co., Ind. E. S. HANSON.

The subject of removing pollen from old combs was up several years ago, and I believe we had one or two communications to the effect that steaming them in a wash-boiler, or some other similar way, till the pollen was quite soft, would enable one to throw it out by means of a honey-extractor. Of course, one must take pains to avoid melting the comb. In our locality we never have too much pollen; that is, when brood-rearing commences in the spring, by distributing the combs of pollen among hives rearing brood largely, we get it all worked up into brood without any trouble. I do not think much pollen is used in the winter, unless brood-rearing is going on largely.—Your question in reference to drone comb is answered by friend Dadant in another column.

THE STANLEY EXTRACTOR.

We have made some slight improvements on the extractor you saw at Detroit, but no great changes, as we think they are now about good enough for practical purposes. We intend to start a branch shop somewhere near Kansas City during the month of February, so that our friends in the South and West may avail themselves of a chance to get a machine at a low rate of freight. G. W. STANLEY.

Wyoming, N. Y., Dec. 19, 1885.

FURTHER FACTS REGARDING FRIEND HOXIE'S HOUSE-APIARY—P. 744, 1885.

As some one may build a house apiary like mine, perhaps I ought to explain it more fully. Those doors with glass in them are not for the purpose of excluding bees or getting them out of the house. They are only for giving light and warmth in cold weather; when the house is opened, no bees ever get on them. I planned my house especially to meet the objection you raised. In opening the hives, the bees fly on to the screen doors; as there is no other place the light enters, all I have to do is to swing the door around against the side of the house with a little jar, and they immediately fly off. I have tin spouts through the house between the hives, which I forgot to mention, and were put in after I got my bees in the house. These spouts are pieces of tin rolled up and put through a 1½-inch auger-hole, level with the floor, and project outside 1½ inches. They are cut with a couple of projections on opposite sides, which are bent over against the inside of the house, and nailed with two tacks. These spouts are closed on the inside with short plugs, with a nail in the end to pull them out by. In order to have the bees that get on the floor go out of these spouts, the tin passageway where it meets the house must be made tight with putty or thick paint, so the light can not shine through, or they will try hard to get out there. In putting up my bees for winter I made, out of pieces of barrel-hoops and pieces of barrel-staves, an article something like the Hill device, which I put under the cloth, and have the covers off; the upper story and all around the hives are filled with dry leaves.

Holloway, Mich., Dec. 1, 1885. H. S. HOXIE.

We have tried similar expedients, friend H., to get the bees out of the house-apiary; but the universal conclusion, by myself and all the hands, is, that it is a good deal simpler and easier to have the bees outdoors where they do not have to be chased after when they get outside of the hives. Although our house-apiary cost several hundred dollars, it stands to-day without a bee in it, and probably will so stand for many years at least.

PACKING POLLEN ON THE HIND LEGS; HOW IT IS DONE.

I have been much interested in your articles on the honey-bee, and in your description of "how the bees back the pollen on their hind legs." You appear to have some doubt just how they manipulate, as their motions are so quick; and I just want to say, that you have got it about right. Now I will tell you what I saw with my own eyes. While visiting at one of my neighbor bee-keepers we were looking through some of his hives and we detected the smell of pine tar. In looking more closely we found that the bees had been using the tar in the place of propolis, and the next question that came up was, "Where did they get the tar?"

TAR AS A SUBSTITUTE FOR PROPOLIS.

"Well," said my neighbor, "the big wagon that we have been hauling stoves on is standing down by the barn, and it has been lubricated with tar, and we will go and see if they are at work at the tar business now."

When we arrived at the wagon there were several bees about the hubs and spindles of each wheel, so we concluded to watch and see how they man-

aged to carry the tar; and as the tar was quite stiff and black we could detect every movement. The bee did not frisk and dodge about with his wings and tail up as they do when gathering pollen, but settled right down to business, biting and twisting away at a little pellet of the black tar; and as soon as he had it in the right shape to suit him, he snatched it from his mandibles with his fore foot, passed it to his next foot, and that foot stuck it in the pollen-basket and patted it down with several strokes. Now you have an idea about how fast Mr. Bee handles his feet; but the pellet of tar was so large and black, the bee at rest, and the sun shining brightly, that we saw with our own eyes, and we both agree that the foregoing is correct.

Valley, Ky., Jan. 16, 1886. G. F. HESELTON.

Thank you, friend F., for so carefully watching the operation. I have seen bees take pellets of wax, but could never witness the action of the middle leg in depositing it in the pollen-basket; but I was anxious to ascertain just how this middle leg grasped the pollen or wax. Did you notice whether the foot of the middle leg, or one of its joints, picked up the little pellets, and transferred them to the hind leg? ERNEST.

A REPORT BOTH ENCOURAGING AND DISCOURAGING.

My bees diminished from 24 to nothing, and my subscription to GLEANINGS has expired. I have enjoyed reading it much, but have yet to learn the taste of nice honey made by my own bees since 1881, when I began with one swarm. I have raised a club for the *S. S. Times*, for 1886, and sent direct to publishers. Thanks for past favors, and best wishes for your future. A. W. VALENTINE.

Bethel, Me., Dec. 22, 1885.

Friend V., we are very sorry to hear that you have not had a taste of honey yet, even with so many bees as that; but we are glad to know that you have dropped off from our list of the *Sunday-School Times*, and have raised a club in your neighborhood. Several have reported in a similar way in regard to the *Times*, and that is what I regard as encouraging; for it can not go into any community without raising the general standard of morals of the people.

LANGSTROTH'S NEW BOOK, ETC.

Mr. Editor:—We wish to thank you for your kind notice of the revision of "father Langstroth's book;" and in answer to inquiries already coming, we wish to state that the revision is not yet half through, owing to our gathering new matter and engravings and information from different parts of Europe and America. The book will not appear before spring, perhaps not till fall. In connection with this work we wish to correct the erroneous idea entertained by some, and found in Mr. Heddon's new book, that we use the closed-end Quinby frame. The frame we use and prefer is the old hanging Quinby frame, made exactly on the principles of the Langstroth invention. The publication of the *new* Langstroth book will be duly advertised in the bee-periodicals, when ready.

Hamilton, Ill. CHAS. DADANT & SON.

THE SOLAR WAX-EXTRACTOR.

I think I have an idea that is good; at any rate, I venture. Take a dish, or rinsing-pan, from your 50-cent counter; solder a tube in the bottom near the side; now place this in a square box with a glass cover. I would have a shelf fixed on the south side of my honey-house, directly under a window. I would use the pan for an uncapping-can, and when it becomes nearly full I would set it out to melt. I am of the opinion that reflectors are unnecessary, also that one glass is enough. The dish-pan is just the right shape, and will astonish one to notice the amount of heat they attract. I have, by holding the pan at the proper angle, lighted a cigar in less than two minutes; but of course the heat is diminished when the bottom is covered with wax. I should like to ask if an ordinary tin tea-kettle, with a screw top, would generate sufficient steam to extract the wax in a Dadant uncapping-can. The kettle could be connected with the can by a few feet of rubber tubing. WALTER S. POUDER.

Groesbeck, O., Jan. 3, 1886.

Thanks, friend P., for your idea of the dishpan. Our largest size of retinned, stamped dishpans would doubtless make quite a powerful reflector. We shall probably soon get out a solar wax-extractor that is effective, and does not cost very much money either—may be something made from common utensils we have in every-day use. A common tea-kettle, arranged as you suggest, would, I think, melt the cappings nicely in a Dadant uncapping-can, providing you do not put in too much at once.

A PLAN FOR HEATING BEE-CELLARS.

I desire to present to you a plan for heating bee-cellars, or, rather, modifying the temperature. Place in your kitchen, near the cook-stove, a boiler that any plumber-supply dealer can furnish for $4.00 or $5.00. Pass a pipe from the boiler through the fuel chamber of your stove, and to your bee-cellar pass a pipe around the cellar near the floor, and back again to the boiler. If the cellar is away from the house, place the pipe five or six feet beneath the surface, fill the boiler and pipes, and you will have a circulation of warm water that will nicely temper the atmosphere, and give an opportunity for good healthy ventilation. If necessary, you can supply a cut-off pipe so you can cut off circulation through the cellar, and cool it if necessary; but I should think it better to ventilate well. You can easily keep the temperature at 40° to 50°, and give the bees a good ventilation. As to detail of arrangements, any plumber can give you full particulars.

CHARLES E. PARKS.

Watertown, Wis., Dec. 30, 1885.

Friend P., your arrangement is substantially the hot-water plan generally used for greenhouses and conservatories, only instead of heating a part of the pipe, the *boiler itself* forms a part of the circuit, and the heat is applied through the boiler, or through flues in the boiler, and the only place where the circuit is open to the outer air is at some point in the greenhouse furthest from the furnace. Here is what is called a stand-pipe, to fill up what is lost by evaporation, and also to allow the water to expand and contract by the different temperatures. As soon as heat is applied, a circulation commences. Hot water goes from the boiler out to the stand-pipe, and the cold water goes back into the boiler again. A home-made apparatus, such as you describe, will often answer very well for special cases.

PRIZES FOR HONEY AND BEES AT FAIRS; HINTS TO VICE-PRESIDENTS.

During the first three months of the year, the premium-lists for County, State, and District Fairs are usually made up. The Vice-Presidents of the National Society should therefore soon commence their work.

I would respectfully suggest that they communicate with the different Official Boards of the Agricultural Societies in their respective States, and endeavor to induce them to offer appropriate prizes for BEES and HONEY at the fairs for the coming season.

The following, or something similar to it, would be well to recommend in the line of prizes:

Best colony of bees in observatory hive; best display of comb honey; best display of extracted honey; best display of beeswax; best honey-extractor; bee-hive for all purposes; and largest and best display of apiarian implements.

Each vice-president and secretary of State and local societies will understand the requirements of their locality, and act and govern themselves accordingly. H. D. CUTTING,

Chairman of Executive Committee.

Clinton, Mich.

I second your motion, friend C., in the above matter.

BROOD WITH THEIR HEADS UNCOVERED.

On page 51, current volume, Mr. C. C. Miller, in speaking of bees with their heads uncovered, says that he doesn't think they are ever left uncovered unless the wax-worm uncovers them or runs galleries over them. Now, I think differently, for I have seen patches as large as a man's hand, and in several combs in the same hive; also in very populous colonies, which would be very likely to keep the wax-worms at bay.

My report for 1885 is not at all flattering, as the few bees I have didn't make any surplus, and most of them will have to be fed in the spring before they will be able to support themselves from the flowers. LUTHER PURDY.

Killbuck, Holmes Co., O.

Friend P., since you mention it I remember too that it is strong healthy colonies, so far as my experience goes, that leave the brood uncovered during hot weather. I can not think that it was wax-worms in our case.

PARADISE LOST.

Please tell us what Paradise Lost is. I think there are many of our readers like yourself who do not know, but are anxious to find out.

Nappanee, Ind., Dec. 25, 1885. I. R. GOOD.

Friend G., our proof-reader says that Paradise Lost is the immortal masterpiece of that great Englishman, John Milton, the blind poet, who died 1608. Great scholars in all foreign nations have studied the English language, simply that they might read Milton's Paradise Lost, as others have studied it to read Shakespeare. As far as I have read it, it seems to be about Satan and his allies before the advent of man upon the earth; and it makes one painfully aware, when he reads it, that Satan is still making himself busy with the affairs of humankind. The beginning of the book has little more Bible authority than the epistle of Jude and Luke 10:18. It can be had anywhere for 15 or 20 cents. In England it has, we believe, been sold at a penny a copy, which would be about a nickel for us.

BEES STEALING EGGS.

I am still reading GLEANINGS. It is a pleasure to peruse its pages, and get the different ideas. A great deal has been said about bees stealing eggs. Last summer I saw a variety of things that bees are in the habit of doing. I had one swarm of blacks that were queenless. These bees were hovering around the entrance of another hive having a queen, and were picking up things that were brought out. I saw that the bees in the hive which contained a queen were cleaning out some moth webs, and once in awhile they would bring out what I thought were eggs, or something like them, and would let them drop in front of the hive; then these blacks would pick them up and examine them, and fly off with them. Since the subject came up, about bees stealing eggs from other hives, I have been thinking it is just what those blacks were on the search for—to get an egg for a queen. It was in the fall, and I united them to a late swarm.

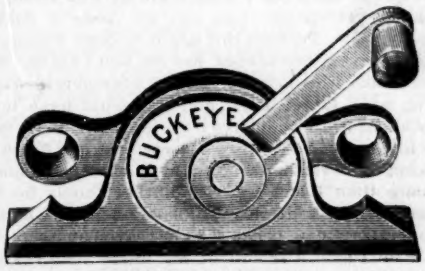
Ashland, O. A. H. BAUM.

Friend B., your suggestion is a valuable one; and since you mention it, it seems that this is the way in which a queenless colony sometimes gets an egg, to save them from utter ruin.

A DEVICE TO FASTEN WINDOWS UP OR DOWN, OR AT ANY POINT.

SOMETHING EFFECTIVE, ALTHOUGH LOW IN PRICE.

FOR many years I have been trying to get something better to hold a window up than a stick or a book, or something of that sort; but although we have tried them, even paying as high as 75 cents per window, I have never had any thing please me so well as the little device illustrated below.



BUCKEYE SASH-LOCK.

This device holds the sash securely by friction in any desired position, as tight as if it were in a vise. It prevents the sash from rattling, and excludes the dust by making tight joints, and yet it does not mar the wood. It is put on with two screws, and can be fitted by an inexperienced hand in three minutes. It works equally well on upper or lower sash, with or without weights. Printed instructions are furnished with each one, as well as screws to fasten them on with, and yet the price is only 5 cts.; 10 for 48 cts.; 100 for $4.50. If wanted by mail, add 2 cts. each extra. The little device is the invention of one of our Medina Co. boys.

TEMPERATURE OF SUB-EARTH VENTILATORS.

SOME INTERESTING EXPERIMENTS.

I HAVE just been making some observations on the temperature of my cellar, sub-earth ventilator, etc., and will give you the result.

Yesterday morning the thermometer stood 14° below zero; and as this was just the temperature outside when C. C. Miller made his tests, it gave me a chance to get at comparative temperatures, and I found my cellar and ventilator just tallied with his; viz., 42° for the cellar, 43° for the air coming in at the sub-earth ventilator. The other end of the ventilator was covered with snow when these tests were made. I wonder if Mr. Miller's was. To-day, in order to know just how much the temperature of the air was raised in passing through under the ground to the cellar, I cleared away the snow at the outside end and put a thermometer in and found it stood 8° above zero, while the general atmosphere was only 4° above, although the bulb of the thermometer was not over 10 inches from the outside. Can it be there is a circulation both ways in an underground ventilator? This would seem to show it, although the inward draft in the cellar is quite strong—so strong that a match burns with difficulty when held in it. Next I again tried the cellar end of the ventilator, and found it stood at 44°, or an increase of 40° degrees over outside temperature. My ventilator, which also serves as a drain, is 80 ft. long and about 8 ft. deep at the cellar end, and comes to the surface at the other end. The opening is made by laying small stones on each side at the bottom of the ditch, so as to leave a space between, and then a flat stone to bridge them over and hold up the dirt. The size of the opening varies, but I think it nowhere less than 2×4 inches.

I consider ventilation of cellars for bees of prime importance, not so much on account of the purifying of the air, as affecting temperature. It is true, that we can keep the temperature up well enough without ventilators; but, can we keep it *down* equally well? Perhaps this might be done with ice; but not every bee-keeper has ice, and I am one of the number who do not believe in a temperature of much over 45° for bees; and if I could have my way about it, I would have it go no lower than 40° nor higher than 50°. How a temperature of 60° can be kept up in this latitude, without artificial means, is more than I can see. Mr. Barber thinks he is master of the wintering problem under his high-temperature plan, because he has saved an average of 80%. I have a record of my losses for 5 years, and the average is a trifle over 16%. I do not think that the advocates of high temperature can claim *all* success for their plan, and I think the idea is fraught with much danger to the novice and inexperienced.

THE TEMPERATURE OF A WELL AND A SWARM OF BEES IN WINTER.

I have also tested the temperature of my well, which is 123 ft. deep, and find the water, when coming direct from the bottom, is 50°. Do you not suppose that the temperature of water in wells will vary more than the temperature of the earth? To test the heat of a cluster of bees, I pushed the bulb of a common dairy thermometer right down among the bees, put back the quilt, left them until they were quiet, and drew it out. It showed 88°, while the lower end of the cluster hung right out in the air, which was 42°. C. A. HATCH.

Ithaca, Wis., Jan. 12, 1886.

AN ARCHED STONE CELLAR, AND THE EFFECT OF A LARGE DRAIN UPON IT 150 YARDS LONG.

Permit me to give you an account of a little experiment, made with reference to the temperature of the earth, etc. I have a cellar, the bottom of which is 12 feet below the surface of the earth. It is covered by an arch of stonework 18 inches thick, with a basement and dwelling-house above it of stone. It is connected with the outside air by 4 flues running from the top of the arch up through and above the top of the house, flues 8 inches square. The cellar has a drain from the bottom, running 150 yards to the lake, from 12 feet below the surface at the cellar, to 4 feet below, where it comes out at the lake. The outlet is two 2-inch tile, but the drain is much larger inside in some places, being of stone.

Jan. 8, thermometer outdoors 14° early in the forenoon, and at 20° when I made the experiment. Temperature of cellar, 45°, six feet above the floor. The wind was coming in at the entrance of the drain sufficiently strong to blow out a candle, and it felt colder than the cellar. I placed the thermometer in the entrance, and was surprised to find it *go up* to 50°. As the air entered the drain at 20°, and was warmed up in its rapid passage to the cellar to 50°, I conclude that the earth at the depth above mentioned must have a temperature greater than 50° here on Pelee Island, Canada.

Jan. 12, thermometer early in the forenoon, zero; at noon, 12° outdoors; 42° in cellar, and 48° in entrance to drain. The cellar is at a low temperature, on account of the flues being open all the time.

THADDEUS SMITH.

Pelee Island, Ont., Can., Jan. 15, 1886.

65° OUTSIDE AND 40° INSIDE.

I am quite interested in the temperature of the earth in different places. In my new bee-cellar, which is six feet deep between floors, the thermometer stands at 46° when it is at 65° outside; and when it goes to 16° below zero outside it goes to 36° above in the cellar, with the sub-earth ventilator open. This ventilator is made so that the entrance for the air is four inches square. It is but 20 ft. long, and is about five feet under ground, nearly all the length of the ventilator. Do you think that 40° is warm enough, or would it be best to use artificial heat to make it warmer? The bees are quiet, and seem to be doing well. WM. L. KING.

Sodus, Mich., Jan. 5, 1886.

Reports seem to indicate, as you will notice, that the temperature of the earth varies considerably, even though the depth be about the same. The Mammoth Cave is probably at the highest extreme, but the depth may, of course, have something to do with it. I believe, however, we can depend upon getting a temperature of between 40 and 50 degrees at any season of the year by going down, say, 10 or 15 feet. Am I not right? Landreth, in his catalogue, says that the best temperature for a greenhouse for lettuce, radishes, etc., is between 40 and 50 degrees; and, if I am correct, the general experience of those who winter bees in cellars seems to be in favor of about the same temperature. Some think 55 degrees will do

no harm; and for our greenhouses 55 degrees would be very desirable, if we could get it without artificial heat.

THE TEMPERATURE OF MOTHER EARTH.

UNIFORM AT A CERTAIN DEPTH.

FRIEND Allen sends us something which is right to the point we were discussing. It is taken from Ganot's Physics, of 1879, and it reads as follows:

"*Terrestrial Heat.*—Our globe possesses a heat peculiar to it, which is called the *terrestrial heat*. The variations of temperature which occur at the surface gradually penetrate to a certain depth, at which their influence becomes too slight to be sensible. It is hence concluded that the solar heat does not penetrate below a certain internal layer, which is called the *layer of constant temperature;* its depth below the earth's external surface varies, of course, in different parts of the globe; at Paris it is about 30 yards, and the temperature is constant at 11.8° C."

Now, 11.8° Centigrade, if my reduction is correct, is the equivalent of 53.54° Fahrenheit.

I presume, however, that proximity to hidden veins of sub-earth water-ways, and possible volcanic localities, may raise the normal temperature of many tracts of country beneath the ground. Nearness to water, rather than to fire of our burning earth, methinks, most generally modifies the cellars of our friends. FRANK ALLEN.

Philipsburg East, P. Q., Can., Jan. 8, 1886.

Here is another:

52° THE TEMPERATURE OF THE WATER FROM A SIDE-HILL.

You ask for information in regard to the temperature of the earth at considerable depth from the surface. On the 25th of Dec., 1885, I tested the water from a spring gushing out from under a hill some 200 ft. in height, and found the temperature to be 53½° by one thermometer, and 53½° by another. Probably 52° is about the exact temperature for this vicinity. LUTHER PURDY.

Killbuck, Ohio.

You notice from these, that the earth does really have a temperature peculiar to itself, but that the depth at which this is reached varies in different localities. You observe, as a further proof, that at Paris, 53.24 deg. F. tallies closely with that of Mammoth cave, which is 55 deg., with my experiments (97 feet below the surface at our factory), which showed 56 deg., and with friend Purdy's side-hill experiments, which showed 52 deg. It seems to me, then, we do not jump at conclusions when we infer from these facts that the earth has a temperature of its own. ERNEST.

Ernest:—I took my A. I. Root thermometer, tied a string to it, and let it down into my spring. After holding it there some time it registered 46°. The temperature of the air was 34°. The spring is three feet deep, the water coming in from the bottom. I wish you and the "queen" that had spunk enough to swarm out in December much joy, and a long, happy, and useful life. C. K. SCHMELTZER.

Scholl's Ferry, Oregon.

Your experiments differ from those just preceding, because you did not go deep enough. Had you gone, say 100 ft. or more, you would probably have struck the zone of "terrestrial heat," which is 53 deg. Thanks for your kind wishes, and I wish the same joy to you; *i. e.*, if you have a "queen." ERNEST.

Noticing the report of H. R. Boardman and T. H. Kloer on temperature of wells, to-day I tested our well, situated in South Florida, Polk Co., 25 ft. deep. The temperature outside was 39°. I drew a bucket of water, immersed the thermometer, and in three minutes removed it and found it just 76°. If I am here in the summer, I will make the experiment then and find if there is any change.

Lakeland, Fla., Jan. 11, 1886. J. D. COLES.

In your southern clime you would have to go probably much more than 100 ft. to arrive at the zone of "terrestrial heat." Your experiments show that the ground near the surface is much warmer than it is here north. ERNEST.

A PLANER SAW, AND HOW MADE.

REVERSIBLE FRAMES, ETC.

SOME time ago I saw a number of articles on saws cutting smooth. The rip-saw I use for sawing sections is 16 inches in diameter; but the diameter would make no difference. As the Simond's saw-works are located in St. Catherine's, 8 miles from here, I probably am somewhat favored. A year ago I went to the works and asked the foreman if they could concave a saw for me. They replied yes. I gave them my order. The center, or eye, is about one-half as thick as the teeth. I think one less concaved would do as well. It is not quite so rigid on the mandrel as it would be were it not concaved. I can saw smoother than it can be planed. The teeth are about ½ inch apart, but I think ¾ would do as well, and cut faster. One tooth is filed square across back and throat, then the two following are filed right and left on the back; but the throats are all filed square across, or at right angles with the saw. This is done to prevent the teeth from springing outward while at work.

REVERSIBLE FRAMES.

I have never used any yet. Why? Because I never thought they would pay any percentage on the capital and time invested. I should prefer using less frames in the brood-nest with dummies, and, rather than handle the frames so much, even if I did get a slight increase of honey, I should prefer keeping a few more colonies, even if all the honey were stored in sections. I do not want any more feeding, unless I wish increase. Two seasons since, I began bee-keeping. I have fed for increase absolutely. I think if a location will not produce a paying surplus without feeding winter stores, pack your grip and look up a better. Time is worth too much to waste.

8 OR 10 FRAMES, WHICH?

For some time back I have been reading the communications in regard to hives containing eight or ten frames. My opinion is this: That it does not make much difference; but I should prefer a ten-frame hive. When a swarm issues from a ten-frame hive, is it not larger in proportion than an eight-frame swarm? It appears to me that I can see considerable in favor of the ten-frame hive, there being just one fifth more bees to work in the sections. WILL ELLIS.

St. Davids, Ont., Can.

Friend E., we have tried saws concaved in the way you mention; but on account of the greater liability to rattle or shake at the outside diameter, where the teeth are, we finally abandoned them. We get saws to cut just as nicely, I think, made all of a thickness, and the expense is much less.—It seems to me you are hardly qualified to decide in regard to reversible frames until you have used them, and watched the working of them. Those who use the eight-frame hive expect, as a rule, to get as much brood in eight frames as we have ordinarily in ten, obliging the bees to put their surplus honey in the sections. Where a queen occupies ten L. frames, it is almost always true that more or less honey is stored in some of the frames along the top-bar, especially toward the upper outside corners.

GLEANINGS IN BEE CULTURE.

Published Semi-Monthly.

A. I. ROOT,
EDITOR AND PUBLISHER,
MEDINA, O.

TERMS: $1.00 PER YEAR, POSTPAID.

For Clubbing Rates, See First Page of Reading Matter.

MEDINA, FEB. 1, 1886.

For where your treasure is, there will your heart be also.—MATT. 6:21.

COMMON nails are ½ c. or more lower, per. lb., than the prices given in our price list.

THE number of our subscribers this 29th day of January is 4981; 19 more, and we shall be 5000 again.

WE take pleasure in calling attention to the advertisement of our good friend Peter Henderson (to be found in this issue), whose name we have so often mentioned as the great pioneer market gardener.

ALSIKE CLOVER.

UNTIL further notice, the price of alsike clover seed will be as follows, instead of according to our price list: Price per pound, 18 cts.; per peck, $2.25; per half bushel, $4.40; per bushel, $8.50; 2 bushels, $16.50.

OUR SEED CATALOGUE.

IT is now ready; but, to tell the truth, when compared with the seed catalogues that are sent out by our great seedsmen, ours does not look very handsome. Never mind; we will give you some prices on some things that perhaps will help the matter somewhat.

DISCOUNTS FOR THE MONTH OF FEBRUARY.

UNTIL further notice, we will give the usual discount of 10 per cent on foundation; 5 per cent on sections; and as an inducement for ordering before the great rush comes, an extra 3 per cent on all goods mentioned in our list, ordered during the month of February.

BASSWOOD HENS'-EGGS.

THESE are not quite as good as the kind they tell about in the papers, that can be told from the genuine egg only by experts, but they are tiptop nest-eggs. They do not freeze, and the old biddies can't eat them up. Price 2 cts. each; 15 cts. for ten, $1.20 per 100, or $10.00 per 1000. If wanted by mail, add one cent each for postage. Supply-dealers who manufacture sections can make bushels and bushels of nice nest-eggs out of refuse bits of white basswood. "Do you see?"

THE SPECIFIC GRAVITY OF MOIST AIR COMPARED WITH DRY AIR.

ON page 89, friend C. C. Miller calls attention to the statement on page 43, that moist air is heavier than dry air. Friend Green has got off from the track here; but he is usually so accurate, it was passed unnoticed. Years ago, Prof. Wise, the distinguished æronaut, made a balloon of linen cloth, filled it with common air, and found that, by sprinkling the outside of the balloon with water, the air inside would be dampened to such an extent as to cause the balloon to rise. Warm air will take up a much larger quantity of moisture than cold air. This we notice by seeing the dew precipitated when a body of air is suddenly cooled.

REVERSIBLE HIVES NOT A NEW THING.

IF our friends will turn to the *A. B. J.* for June, 1870, they will find an engraving of John M. Price's revolvable and reversible comb hive. The hive is made to reverse not only the brood combs, but the wide frames holding sections as well; and they not only go either side up, but *any* side up, for the frames are perfectly square. Friend Price, at the time the subject was up, urged quite vehemently the advantages of reversible frames, as well as reversible hives, for his hive reverses just as well as each frame reverses. Friend P. is now located in Florida; and with his sixteen years of experience with these reversible frames and reversible hives he ought to be able to give us some favorable suggestions. Can't you do it, friend P.?

SHALL WE FEED OUR BEES SUGAR STORES FOR WINTER?

THE statements made by our good friend Wright and Mrs. Harrison may be true; but for all that, if I found by experience that my bees would winter safely on stores of sugar, and would not so winter on honey, I should winter them on sugar, and try to have faith in educating humanity to understand these things as they are. I do not believe my friends and neighbors would conclude I was feeding the bees sugar, and selling it for honey, even if they did see me buying barrels of sugar at a certain season of the year. I believe, however, that the general testimony indicates that stores of good sealed honey are pretty nearly as safe as sugar, and therefore the only advantage in sugar feeding will be when we have got to feed something, and, of course, we may prevent this state of affairs by laying up a reserve stock of combs full of sealed honey; and at the present prices of honey and sugar, I am inclined to think reserved combs are about as cheap feed as we can have, and it is certainly handier than any kind of a feeder. What bee-keeper has not enjoyed having great heavy combs of stores to give any colony that happens to need food? With a hive holding ten frames, unless the colony is remarkably strong in numbers, there ought to be a sufficient surplus in the brood-nest to prevent any such thing as starvation at any time of the year.

THE NEW AGRICULTURE; OR, THE WATERS LED CAPTIVE.

We have finally made quite a purchase of the above-named book, written by the Honorable A. N. Cole. Of course no one can announce positively on the system laid down in this book until it has had further test in the hands of the average market gardeners and fruit-growers. We extract the two following testimonials in regard to the book. The first is an extract from the report officially made to the Farmers' Club, of Elmira, N. Y., by its President, Mr. James McCann, and ex-President Geo. W. Hoffman:

The changes wrought in the soil and its products constituted a great surprise. * * * Heavy showers had fallen in the week before our visit, but there was not the slightest appearance of washing. * * * There was a full crop of the most remarkable strawberries, one peculiarity of which was the absence of what may be termed a core or hard stem in the middle; they were juicy and tender all the way through. One plant of older setting had, we should judge, enough berries to fill a hat if they could be picked at one time.

The other was written for the *Husbandman*, of Elmira, N. Y., by the Hon. John H. Selkreg, of Ithaca, N. Y.:

On the 9th of October, the present month, I looked over and critically examined the garden and field which have been trenched and treated by Mr. Coe. I found strawberry vines which, to me, seemed more luxuriant and thrifty than any which have fallen under my eye at any time. I saw raspberry canes of enormous size, I venture to assert more than one inch in diameter, and of extraordinary freshness and vitality. I saw Champion of England peavines which measured, standing, SEVEN feet from the ground, and containing blossoms, incipient pods, and full-grown peas, in quantity greater than I ever before had knowledge of, and I ate of those peas for dinner that day, and know their unparalleled flavor and delicacy. I measured a pumpkin, in girth five feet four inches; several squashes of about four feet diameter (length); and I helped dig a SINGLE HILL of Early Rose potatoes which, when weighed, tipped the scales at sixteen and one-half pounds, over one quarter of a bushel, five of these potatoes measuring an average of eighteen inches around in length, and nine inches in circumference. Taken as a whole, the wealth of growth upon the land cultivated by Mr. Cole, in my judgment, far exceeds what can be found elsewhere in this or any other State."

The price of the book is $2.00; but we will furnish it to subscribers of GLEANINGS for $1.40; 2 books, $2.50; 10 or more, $1.00 each. If wanted by mail, add 10 cts. each extra for postage.

SHIPPING GOODS WITHOUT CALLING THEM BY THEIR RIGHT NAME.

A CUSTOMER orders a package of honey, but tells us to be sure and not let anybody know the contents of the package; for if his customers found out he was purchasing honey from somewhere else they would jump to the conclusion that it was manufactured, and wouldn't buy. Now, there are very great objections to any such way of doing business. I don't believe it will pay any man, in the end, to mislead his patrons in any way, shape, or manner, either directly or indirectly. The railroad company are at once suspicious of any package where the shipper seems to desire or prefer not to mark on the outside just what the package contains. Of course, they can not tell what classification it should be shipped under, and so, to be on the right side, they will mark it first class, or even double first class. Some time ago the matter was discussed about marking barrels of honey, "syrup," so as to get a low rate of freight. I do not know how a Christian, or even a *simply honest* man, could consistently do any thing of this sort; and after studying the matter over quite a little, I can't see how a Christian, or even an honest man, can very well refuse to tell just what a box or barrel contains when he hands it over to the railroad company. If you can not sell honey and call it by its right name, and tell your customers exactly where you got it, don't undertake to sell any honey except what you raise yourself. May be the above advice may hinder in some degree my selling out that carload that came from California; but I would rather know that my patrons were frank and outspoken in their dealings, than to sell a hundred carloads of honey. The matter of buying sugar in the fall to feed your bees in the winter, comes in here indirectly. I shall always purchase sugar for winter feeding whenever I think it advisable, and I shall do it in broad daylight, without any effort to get any of the barrels out of sight, as if I were ashamed of it. Whenever any inquiry is made, I shall explain the matter as well as I can. If the public don't accept my explanation, I shall try to bear it.

CATALOGUES RECEIVED FOR 1886.

The friends will please put a date on their circulars when they are having them printed; for if they don't, how else are we to tell whether it is the same circular we noticed last year, or the year before, or a new one?

J. A. Humason, Vienna, O., sends a 4-page circular; specialty, chaff hives; also Italian bees.

J. B. Mason & Son, Mechanic Falls, Me., send us a little pamphlet of 50 pages, containing much valuable matter, besides prices on almost every thing pertaining to the bee-business.

Joseph Nysewander, Des Moines, Ia., sends us a catalogue of 48 pages, supplies in general.

Wm. Groff, Rome, N. Y., sends a 4-page circular. His specialty is Groff's Common-Sense bee-hive. May we suggest to friend G., that the term "Common-Sense," as applied to bee-hives is in rather bad favor? It was especially so five or six years ago, as he will see by our back volumes.

Hughes & Tatman, North Topeka, Kan., send us their circular—specialties, Plymouth Rock and Light Brahma fowls; also bees and queens.

. Kennedy & Leahy, Higginsville, Mo., sends us their price list of last year, with change of prices on the cover.

J. T. Fletcher, Clarion, Pa. Specialty, fowls; also bees and queens.

C. W. Costellow, Waterboro, Me., 12-page price list; general supplies.

James Hedden, Dowagiac, Mich., sends us a 26-page circular; specialty, Heddon's new hive. This circular contains considerable matter of interest to bee-keepers, aside from the goods friend H. offers for sale.

J. V. Caldwell & Co., Cambridge, Ill., send a 16-page catalogue; specialty, Given foundation-press.

E. T. Lewis & Co., Toledo, O., send us a 32-page catalogue, very comprehensive, fully illustrated.

Among the catalogues lately printed at this office we notice the following:

A 12-page price list for J. W. Bittenbender, Knoxville, Ia.; supplies generally.

A 12-page list for for F. Boomhower, Gallupville, N. Y.; specialty, Italian bees and queens, and English rabbits.

A 6-page list for John Nebel & Son, High Hill, Mo.; bees, queens, fdn., etc.

A 4-page list for B. V. Hubbard & Co., Temple, Texas; hives, and supplies in general.

CONVENTION NOTICES.

The annual convention of the R. I. Bee-keepers' Society will be held February 11, 1886, in Providence. GEO. A. STOCKWELL, Sec.

Providence, R. I., Jan. 27, 1886.

The Seventeenth Annual Convention of the New York State Bee-Keepers' Association (formerly North-Eastern) will be held in Rochester, N. Y., on 17th, 18th, and 19th of Feb., 1886.

Perry Center, N. Y. F. C. BENEDICT, Sec.

AN OMISSION AT THE DETROIT CONVENTION.

The report of the committee on exhibits at the recent convention of the N. A. B. K. A. at Detroit did not include the exhibit of G. B. Lewis & Co., of Watertown, Wis. They call attention to the omission, and say, "Our sections were displayed in the sample room of the Newhall House, and also they were brought down to the office." This accounts for the omission in the report, for the committee supposed that all the exhibits were made at the Antisdel House. They also say, "We exhibited only 4¼x4¼ open-top, very white, basswood sections, and some English section-folders."

Toledo, O., Jan. 22, 1886. A. B. MASON.

STANLEY'S
AUTOMATIC HONEY - EXTRACTOR

Is acknowledged by all practical bee-keepers to be the most perfect and complete honey-extractor known. The weight of the combs reverses them the instant the motion stops, and they never miss. The Automatic is highly recommended by the following prominent bee-keepers:

Ira Barber, Prof. A. J. Cook, W. E. Clark, H. D. Cutting, F. F. Crooker, C. P. Dadant, W. T. Falconer, James Heddon, C. R. Isham, D. A. Jones, Dr. A. B. Mason, J. H. Martin, A. E. Manum, S. T. Pettit, A. I. Root, L. C. Root, J. H. Robertson, I. L. Scofield, F. A. Salisbury, J. M. Shuck, T. L. Von Dorn, and a host of others.

On account of the great call for our machines throughout the West and South-west we have decided to start another factory to accommodate that trade, and for that purpose J. E. Stanley has located at Topeka, Kansas, where he will manufacture the Automatic honey-extractor and dollar smoker, and where he will, in connection with Stanley Bros. there, establish a honey-store. Stanley Bros. are extensive wholesale dealers in fruits, nuts, and confectionery, and have a large trade through Kansas, Nebraska, and Colorado. J. E. Stanley is a practical honey-man, and will have full charge of the honey department.

All orders for extractors west of the Mississippi River (except from California), and also Wisconsin, Illinois, Kentucky, Tennessee, Mississippi, and Alabama, should go to the Western house. Orders for all other States east of the Mississippi River, as well as from all foreign countries, should come to the Eastern house.

Californians wanting our machines should apply to Messrs. Baker & Barnard, of San Buenaventura, Ventura Co., Cal. These parties order the reels from us, and make machines to order. This will be a great saving of freight to purchasers.

Our prices for machines taking the L. frame are as follows:

2-frame machines, without gear					$12 00
3	"	"	"	"	16 00
4	"	"	"	"	21 00
6	"	"	"	"	30 00

The above prices are for our machines without gear, but with crank attached to top of center-shaft. We add a strong vertical gear, with crank at side of can, for $2.00 extra, or a horizontal gear for $1.00 extra. If any frame, except the standard L., 9⅛x17⅝, is used, please mail us a sample frame and get prices on the machine you want.

Always address the house in your own territory.

J. E. STANLEY, Topeka, Kansas. G. W. STANLEY, Wyoming, N. Y.

This advertisement will not appear again. 3d

LEGS AND ARMS
(ARTIFICIAL)
WITH RUBBER HANDS AND FEET.

The Most Natural, Comfortable and Durable.

THOUSANDS IN USE.

New Patents and Important Improvements.

Special attention given to

SOLDIERS,

Ill. Pamphlet of 160 Pages SENT FREE.

A. A. MARKS,
701 Broadway, New York.

18-5db

Please mention this paper.

WE WILL SELL

Chaff hives complete, with lower frames, for $2.50; in flat, $1.50. A liberal discount by the quantity. Simplicity hives, Section Boxes, Comb Fdn., and other Supplies, at a great reduction. We have new machinery, and an enlarged shop. **Italian Bees and Queens.** Send for Price List. 23 22db

A. F. STAUFFER & CO., Sterling, Ills.

DADANT'S FOUNDATION FACTORY, WHOLESALE AND RETAIL. See advertisement in another column. 3btfd

WILL SELL 20 COLONIES OF BEES

In Simplicity hives, in fine condition, for $5.00 each, if paid for now. Will ship bees in spring. Also a

BARNES FOOT-POWER SAW,

With counter-shaft and pulleys, two extra saws, cutter-heads, etc., for $30.00. Cost me over $50.00. Purchasers for the above can, if they prefer, send their cash to A. I. Root, Medina, O. 3-4-5d

I. L. PARKER, TRACY CITY, GRUNDY CO., TENN.

EXCHANGE DEPARTMENT.

Notices will be inserted under this head at one-half our usual rates. All ad's intended for this department must not exceed 5 lines, and you must SAY you want your ad. in this department, or we will not be responsible for any error.

WANTED.—To exchange new Novice honey-extractors for A. and L. frames; will exchange for a bone-grinder, or good books, or any thing useful. GEO. W. BAKER, Milton, Ind. 3-5 7-9-11-13d

WANTED.—To exchange one-half bushel of extra fine white-clover seed for alsike-clover seed. 19tfdb M. A. GILL, Viola, Richl'd Co., Wis.

WANTED.—To exchange or sell. Friends, I have 15 pairs of the celebrated Bonney's stock of Brown Leghorns that I will sell at $3.00 per pair, or will exchange for good beeswax at 25 cts. per pound. Circulars free. Ref., A. I. Root. 24tfdb A. H. DUFF, Creighton, Guern. Co., O.

WANTED.—To exchange golden-willow cuttings for Italian queens. I will book orders now, and send the willows as early as will do next spring; queens wanted in May and June, 1886. 2 dozen cuttings for a warranted, and 4 dozen for a tested; also one weeping-willow cut with each dozen. Will send by mail. S. C. FREDERICK, 24, 5db Coal Vale, Craw. Co., Kan.

WANTED.—To exchange a buzz and scroll saw combined, one polyoptican, new, one Smith American cabinet organ (catalogue price $210.00), all in perfect condition, for Plymouth Rocks, Chester or Poland pigs, Holstein or Jersey calves, or young cattle. L. W. LIGHTY, 2tfdb Mulberry, York Co., Pa.

WANTED.—To exchange strawberry and raspberry plants for $1.00 or tested queens, or pounds of bees (in spring). Address 2 tfdb C. W. PHELPS & Co., Tioga Centre, Tioga Co., N. Y.

WANTED.—To exchange choice grapevines (5c each), fdn. machine, and hand printing-press, for buckwheat, beeswax, etc. Write to 3d F. C. MORROW, Wallaceburg, Ark.

WANTED.—To exchange two handsome cases of stuffed birds, for bees, comb fdn., or ex. honey; also eggs of P. Rocks and Brown Leghorns, $1.50 per sitting, for bees, queens, or comb fdn. mill. Address T. G. ASHMEAD, Williamson, 3d Wayne Co., N. Y.

WANTED.—To exchange for a farm, or sell my place, consisting of 7½ acres of ground in the town of Lewisville, Ind. A small dwelling, poultry-houses, stable, and an everlasting gravel-bank, which affords about 3000 loads of gravel every year, which sells readily at from 10 to 15 cts. per load. The place is in a good honey locality, and good shipping facilities. Apiary slopes to the south and east; is surrounded on the north and west by a tight plank fence, about 7 ft. high. Apiary is set in grapevines. I will give five years' time, if sold. Direct all communications to 3-5-7d GEO. W. BAKER, Milton, Ind.

WANTED.—To exchange Simplicity hives for a circular-saw mandrel for hive-making by steam power. Will sell hives (in the flat) cheap for cash, or will take one-third pay in full colonies of bees. Hives in any quantity to suit customers, up to a carload per day. G. A. FARRAND, 3tfdb Rockport, Cuyahoga Co., O.

CONTRACTS WANTED
—WITH—
SUPPLY DEALERS
FOR NEXT SEASON'S STOCK OF GOODS.

CHAFF, STORY AND HALF CHAFF, AND SIMPLICITY HIVES, SMOKERS, EXTRACTORS, COMB FOUNDATION, FRAMES, SECTIONS, BOOKS, ETC.,

At wholesale and retail. Unexcelled facilities. Circulars and estimates free. Successors to S. C. & J. P. Watts. Sta. Kerrmore, B. C. C., & S. W. R. R.

WATTS BROS., Murray, Clearfield Co., Pa.
1tfdb.

LOOK HERE!

To introduce my strain of pure bright Italians, equal to any in the United States, I will offer tested queens, $1.00 each; extra fine, selected, $1.50 each; one-frame nucleus, consisting of one extra select queen, one frame of brood, ½ lb. bees, for $2.00. If you want any bees, send me your address on postal and I will send you sample by return mail. Beeswax or honey taken in exchange.
22tfdb **THOMAS HORN,**
Box 691, Sherburne, Chen. Co., N. Y.

THE CANADIAN BEE JOURNAL.
WEEKLY, $1.00 PER YEAR.

D. A. Jones & Co., Publishers, Beeton, Ont., Can.

The only bee journal printed in Canada, and containing much valuable and interesting matter each week from the pens of leading Canadian and United States bee-keepers. Sample copy sent free on receipt of address. Printed on nice toned paper, and in a nice shape for binding, making in one year a volume of 832 pages. 9tfb

SECTIONS.

Western headquarters for bee-men's supplies. Four-piece sections, and hives of every kind, a specialty. Flory's corner-clamps, etc. Orders for sections and clamps filled in a few hours' notice. Send for sample and prices.
22 21db **M. R. MADARY,** Box 172. Fresno City, Cal.

DADANT'S FOUNDATION

is asserted by hundreds of practical and disinterested bee-keepers to be the cleanest, brightest, quickest accepted by bees, least apt to sag, most regular in color, evenest, and neatest, of any that is made.

It is kept for sale by Messrs. A. H. Newman, Chicago, Ill.; C. F. Muth, Cincinnati, O.; Jas. Heddon, Dowagiac, Mich.; F. L. Dougherty, Indianapolis, Ind.; Chas. H. Green, Berlin, Wis.; Chas. Hertel, Jr., Freeburg, Ill.; Ezra Baer, Dixon, Lee Co., Ill.; E. S. Armstrong, Jerseyville, Illinois; Arthur Todd, Germantown, Philadelphia, Pa.; E. Kretchmer, Coburg, Iowa; Elbert F. Smith, Smyrna, N. Y.; C. T. Dale, Mortonsville, Ky.; Clark Johnson & Son, Covington, Kentucky; J. B. Mason & Sons, Mechanic Falls, Maine; C. A. Graves, Birmingham, O.; M. J. Dickason, Hiawatha, Kan.; J. W. Porter, Charlottesville, Albemarle Co., Va.; E. R. Newcomb, Pleasant Valley, Dutchess Co., N. Y.; J. A. Humason, Vienna, O.; G. L. Tinker, New Philadelphia, O., and numerous other dealers.

Write for *samples free*, and price list of supplies, accompanied with **150 Complimentary** and *unsolicited testimonials*, from as many bee-keepers, in 1883. *We guarantee every inch of our foundation equal to sample in every respect.*

CHAS. DADANT & SON,
3btfd **Hamilton, Hancock Co., Illinois.**

FOR SALE. Five pair fine Pekin ducks, at $4.00 per pair.
1tfdb D. D. FARNSWORTH, Clive, Polk Co., Iowa.

Bee-Keepers' Supplies.

NORTH-WESTERN CHAFF HIVES, 4-PIECE SECTIONS DOVETAILED, FRAMES, HONEY-BOXES, ETC.

Address **R. SCHMIDT,**
6db **Caroline, Shawano Co., Wis.**

MUTH'S HONEY-EXTRACTOR,

SQUARE GLASS HONEY-JARS,
TIN BUCKETS, BEE-HIVES,
HONEY-SECTIONS, &c., &c.
PERFECTION COLD-BLAST SMOKERS,

Apply to CHAS. F. MUTH & SON,
CINCINNATI, O.

P. S.—Send 10-cent stamp for "Practical Hints to Bee-Keepers." 1tfdb

IMPORTED QUEENS.

In April,	-	-	-	-	-	-	11	francs	in gold.
May and June,	-	-	-	-	-	-	10	"	" "
July and August,	-	-	-	-	-	-	9	"	" "
September and October,	-	-	-	-	-	-	7	"	" "

No order received for less than 8 queens. Queens which die in transit will be replaced only if sent back in a letter. CHARLES BIANCONCINI & CO.,
1-11d Bologna, Italy.

JOB LOT OF WIRE CLOTH
AT GREATLY REDUCED PRICES.

SECOND QUALITY WIRE CLOTH AT 1½ CTS. PER SQUARE FT.

SOME OF THE USES TO WHICH THIS WIRE CLOTH CAN BE APPLIED.

This wire cloth is second quality. It will answer nicely for covering doors and windows, to keep out flies; for covering bee-hives and cages for shipping bees; making sieves for sifting seeds, etc.

Inches Wide.	No. of Rolls.	Number of Square Feet contained in each Roll Respectively.
10	1	1 roll of 72 s. f.
20	3	3 rolls of 166 s. f. each
22	1	1 roll of 160 s. f.
24	3	3 rolls of 200 s. f.
26	71	22 rolls of 217, 38 of 216, 2 of 195, 1 of 156, 2 of 215, 1 of 210 s. f.
28	13	11 rolls of 233, and 2 of 234, s. f.
34	7	5 rolls of 281 s. f.
38	37	28 rolls of 316, 3 of 225, 2 of 317, 1 each of 190, 632, 126, and 215 s. f.
42	1	1 roll of 245 s. f.
44	2	1 roll of 366, 1 of 348 s. f.
46	1	1 roll of 152 s. f.
48	4	4 rolls of 400 s. f.

FIRST QUALITY WIRE CLOTH AT 1¾ CTS. PER SQUARE FT.

The following is first quality, and is worth 1¾ cts. per square foot. It can be used for any purpose for which wire cloth is ordinarily used; and even at 1¾ cts. per sq. ft. it is far below the prices usually charged at hardware and furnishing stores, as you will ascertain by making inquiry. We were able to secure this very low price by buying a quantity of over one thousand dollars' worth.

Inches Wide.		
20	1	1 roll of 153 s. f.
22	1	1 roll each of 88, 143, 92 s. f.
24	43	rolls of 200 sq. ft. each; 1 each of 96, 120, 168, 190, 40, 150 140 sq. ft.
26	57	rolls of 216 sq. ft. each; 1 each of 199, 195, 201, 200, 227, 54, 204 sq. ft.
28	73	rolls of 223, 11 of 224, 3 of 219, 8 of 222, sq. ft.; 1 each of 70, 245, 257, 93 sq. ft.
30	36	rolls of 250 sq. ft.; 1 each of 137, 235, 125, 125, 220, 227, 237, 235, 275, 240 sq. ft.
32	13	of 306, 7 of 256, 2 of 253 sq. ft.; 1 each of 233, 250, 275 sq. ft.
34	30	rolls of 283 sq. ft. each.
36	22	rolls of 300 s. f. each; 1 each of 288, 150, 279, 285, and 72 sq. ft.
38	1	roll each of 300 and 316 sq. ft.
40	1	roll of 233 square feet.
42	1	roll of 350 square feet.
46	1	roll of 192 square feet.

A. I. ROOT, Medina, Ohio.

75 COLONIES OF BEES FOR SALE.
Address **J. S. Baxter,**
1tfdb **Corinth, Alcorn Co., Miss.**

BURPEE'S SEEDS,

FARM ANNUAL FOR 1886

Will be sent **FREE** to all who write for it. It is a **Handsome Book of 128 Pages,** with hundreds of new illustrations, two **Colored Plates,** and tells all about **the Best Garden, Farm** and **Flower Bulbs, Plants, Thoroughbred Stock** and **Fancy Poultry.** It is the only complete catalogue of the kind published, and describes **RARE NOVELTIES** in **VEGETABLES** and **FLOWERS,** of **real value,** which can not be obtained elsewhere. Send address on a postal to

W. ATLEE BURPEE & CO., PHILADELPHIA, PA.

D-2-6-86

BEE-KEEPERS! If you are in need of hives, sections, comb fdn., honey-extractors, bees and queens, or any implement used in the apiary, send for price list to J. SWALLOW, 2816 Mo. Avenue, St. Louis, Mo. Successor to Buck & Swallow. 3-5d

Wanted. A partner, to go in the bee and supply business with me, for the business is increasing so fast that I can not manage it myself. Address or call upon LOUIS WERNER, 3-4d Edwardsville, Madison Co., Ill.

AT KANSAS CITY, MO.,

I RAISE PURE ITALIAN BEES FOR SALE.

Untested queens, in May $1 50
" " June 1 25
" " after June 1 00
Tested queens, double the above prices.
Full colonies, before July 1 ..... 12 00
" " after " 10 00
Bees, per half-pound, same prices as untested queens.

For discounts on large orders, see my postal circular. I warrant my untested queens to be *purely mated.* If any of the friends who have dealt with me heretofore are not satisfied, I shall be glad to have a full statement of the matter from them, and will do the best that I can to render satisfaction.

3tfd **E. M. HAYHURST, P. O. Box 60.**

ALSIKE CLOVER SEED WANTED. Send best offers to T. P. ANDREWS, Farina, Fayette Co., Ill. 3d

HAVING again located at Nappanee, I shall be better prepared than ever to furnish bees and queens the coming season to my many friends and customers, as I have a large apiary of Syrian bees in the South, and one of pure Italians here, to draw from. Send for price list. 3-5d I. R. GOOD, Nappanee, Ind.

Eggs, $1.25 PER 13, from pure-bred, single-comb Brown Leghorns. Unexcelled layers. Address H. B. GEER, Nashville, Tenn., or F. W. GEER, St. Mary's, Mo. 3 8db

FOUR-horse portable engine, to exchange for larger one, or cash. Bees, Carniolan and Italian queens, supplies, 12 in. car-wheels and axles, to exchange for shafting and journals, cord-wood and dovetailing mandrels and saws, wood-lathe, shaper-spindles, counter shaft, or cash. J. W. CLARK, 3 Box 34, Clarksburg, Moniteau Co., Mo.

Mirror, or Parti-scale Carp For Sale.

Spawners, 10 to 12 inches in length, per doz., $6.00
" 8 to 10 " " " " " 5.00
Small fish, 2 to 4 " " " " 100, 5.00
W. H. CARPENTER,
3-6db Springboro, Warren Co., Ohio.

NICE FOUNDATION, 35 CTS. PER LB. W. T. LYONS, Decherd, Franklin Co., Tenn. 3-7

FOR SALE, 20 COLONIES ITALIAN BEES, on 7 Langstroth frames, in shipping-boxes, $4.50, or shipped in Parker chaff hive, $6 50 per colony. WM. AMELANG,
3tfdb Ottumwa, Wapello Co., Iowa.

UNTESTED QUEENS, reared from BEST IMPORTED nuclei, and full colonies.
3-5d N. ADAMS, Sorrento, Fla.

W. Z. HUTCHINSON,

In order to more fully supply the wants of his customers, has entered into partnership with his neighbor, R. L. Taylor, and will offer for sale bees (full colonies, or by the pound), queens, Given fdn., white poplar sections, hives, cases, feeders, empty combs, etc., etc. Also hens' eggs, for hatching, of three varieties. For circular and price list, address
W. Z. HUTCHINSON,
3tfd Rogersville, Genesee Co., Mich.

Wanted. Situation as apiarist, for wages, or bees on shares, in one of the following States: Louisiana, Arkansas, Tennessee, Kentucky, or California. Fourteen years' experience; can do all manner of hive work or foundation, etc. Address 3-6db S. SMITH, New Smyrna, Volusia Co., Fla.

GOLDEN-WILLOW CUTTINGS, for one cent each postpaid. Two-cent stamps preferred.
3d S. HEATH, Rimer, Armstrong Co., Pa.

KIND WORDS FROM OUR CUSTOMERS.

THE BEE-PAPER.

If there is any other paper that I have not yet heard of that is equal to GLEANINGS, put my name down. I have four bee-journals, and GLEANINGS is, I think, *the* bee-paper. H. E. HILL.
Titusville, Pa., Dec. 17, 1885.

OUR CALIFORNIA HONEY.

I received the can of honey all right, and am very much pleased with it. I think it is as nice honey as I ever saw or tasted. I shall want some more of it after awhile. C. E. JONES.
Delaware, Ohio.

The two cans of California honey shipped Dec. 19th arrived here on the 30th in first-class condition. The honey has been declared by several persons as the finest they ever saw or tasted. I think it will sell rapidly. 3—GUSTAVUS WIEDERHOLD, 5—7.
Yonkers, N. Y., Jan. 1, 1886.

THE BEE-KEEPER'S WHEELBARROW.

The goods came all right. The wheelbarrow is the most complete, I think, I ever saw. Oliver, 8 years old, can wheel 50 lbs. on it with ease. The bees are doing finely, with good stores and a fly every few days. C. F. UHL.
Millersburg, Ohio, January 1, 1886.

WHAT G. M. DOOLITTLE THINKS OF GLEANINGS.

GLEANINGS for Dec. 15 has come to hand, the wrapper telling me that you make me a present of it for 1886. Very many thanks indeed. I wish to say that GLEANINGS is gaining ground; i. e., growing better and better every year.
G. M. DOOLITTLE.
Borodino, N. Y., Dec. 22, 1885.

A KIND WORD FOR THE SECTIONS WE ARE MAKING THIS YEAR.

The sections are just a little bit the nicest I have ever had. I have bought all my sections for the last 7 years, and these are the first that have altogether filled my idea as to what they ought to be. Although I have never complained to dealers, I have always thought they might be a little more careful about dovetailing the ends so they would not leave a jog of a 1-16 or ⅛ when driven together. These are just right. The counter goods are fully worth the money. Please accept thanks.
Summersville, Pa., Jan. 20, 1886. I. A. CLARK.

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100 COLONIES OF
ORANGE-COLORED ITALIANS
—AND—
WHITE-BANDED ALBINO BEES
FOR SALE.

THOSE IN WANT OF BEES, QUEENS, OR APIARIAN SUPPLIES WILL DO WELL TO SEND FOR MY 26TH ANNUAL PRICE LIST BEFORE PURCHASING. ADDRESS

WM. W. CARY,
Successor to WM. W. CARY & SON,
4tfdb **Coleraine, Mass.**

N. B.—The best testimonial I can give is, that my trade has more than doubled in the past three years.

STRAWBERRY PLANTS.

I will sell, from now until May 1st, in lots not less than 3000, packed and delived at express office.

Pure Crescent ..... $2.00 per 1000
" Sucker State ..... 3.00 " "
4-5-6d C. F. TYSON, Centralia, Marion Co., Ill.

DUNHAM AND VANDERVORT FOUNDATION

We have a large stock of choice yellow beeswax, and can furnish Dunham comb fdn. for brood comb, cut to any size for 42c per lb. Extra thin Vandervort foundation, 48c per lb. We guarantee our fdn. to be made from pure beeswax, and not to sag. Will work up wax for 10c per lb., and 20c per lb. for section.
F. W. HOLMES,
4tfdb Coopersville, Ottawa Co., Mich.

PURE ITALIAN BEES.

Full colonies, nuclei bees by the pound, and Queens a specialty. Also, Simplicity Hives, Frames, Sections, Comb Foundation, and supplies generally. ☞ Send for my circular and price list. You will save money by so doing
C. M. DIXON,
4-11-db PARRISH, FRANKLIN CO., ILL.

A BARGAIN.

As I am going to move my apiary, I will sell 50 colonies of bees more at a bargain; 25 colonies Italians, with tested queens, from imported mothers; 25 colonies hybrids. Also untested Italian queens from imported mothers, and bees by the pound, for sale. Send for special prices, stating how many are wanted. Address W. S. CAUTHEN,
4-5-d Pleasant Hill, S. C.

BEES IN IOWA. SEE FOSTER'S ADVERTISEMENT.

DADANT'S FOUNDATION FACTORY, WHOLESALE AND RETAIL. See advertisement in another column. 3btfd

180 ACRES

Selected, high, gray hammock and pine lands, not subject to overflow, situated on the

GULF-COAST RIDGE, IN TROPICAL FLORIDA,

81° 50′ lon. west of Gr., and 26° 35′ north latitude; 16 miles south of Fort Meyers, 2½ miles distant from Ostego Bay, crossed in its whole length by the lovely Estero Creek, for the culture of Oranges, Mangoes, Pineapples, Bananas, Cocoanuts, Date-palms, etc. Climate grand and delightful; water good and healthful; health, unsurpassed. In 5-acre lots, $12.50 per acre; the whole, or a 140-acre tract, $10.00 per acre. If wanted, 70 to 100 cols. of Italian bees for sale. Apply to **G. DAMKOHLER,**
4d P. O. PUNTA RASSA, MONROE CO., FLA.

TO CLOSE OUT my stock of COMB FOUNDATION, I offer *extra thin* at 45c per lb. *Brood*, 35c. Samples.
4d H. L. GRAHAM, Grandview, Louisa Co., Iowa.

EXCHANGE DEPARTMENT.

Notices will be inserted under this head at one-half our usual rates. All ad's intended for this department must not exceed 5 lines, and you must SAY you want your ad. in this department, or we will not be responsible for any error.

WANTED.—To exchange nice new apple-seeds for beeswax. M. ISBELL.
4-5d. Norwich, Chenango Co., N. Y.

WANTED.—To exchange, a home-made foot-power saw for bees. Write for particulars.
5tfdb. W. S. WRIGHT, Battle Creek, Mich.

WANTED.—To exchange Italian bees, queens and nuclei, for an extractor, supplies in the flat, and comb fdn. MISS A. M. TAYLOR,
4-5-6d. Mulberry Grove, Bond Co., Ill.

WANTED.—To exchange bees or eggs from Light Brahmas (Tees' Strain), for wire netting.
4tfdb. W. E. FLOWER, Ashbourne, Mont. Co., Pa.

WANTED.—In exchange for printing, or outfits for embroidery, at $1.00 or more each, 40 colonies of bees in Simplicity hives, Langstroth frames, one hive or more in a lot—deliver in April; or supplies, or poultry. W. EARLE CASS,
4d Newark, New Jersey.

WANTED.—To sell or exchange new Heddon hives, reversible frames, 17⅝x9⅛; also Plymouth Rocks, for extracted honey, Michigan quart berry-boxes, Jewell strawberries, Nemeha, Golden queen, and Shaffer raspberry plants, and pruning-shears.
E. J. SCOFIELD, Hanover, Rock Co., Wis.

WANTED.—To exchange one-half bushel of extra fine white-clover seed for alsike-clover seed. 19tfdb M. A. GILL, Viola, Richl'd Co., Wis.

WANTED.—To exchange Stanley's Automatic Honey-Extractor for bees in spring, or for gold dollars now (the latter preferred). See advertisement in GLEANINGS for Feb. 1, or address
J. E. STANLEY, or W. G. STANLEY,
4-d Topeka, Kansas, Wyoming, N. Y.

WANTED.—To exchange or sell. Friends, I have 15 pairs of the celebrated Bonney's stock of Brown Leghorns that I will sell at $3.00 per pair, or will exchange for good beeswax at 25 cts. per pound. Circulars free. Ref., A. I. Root.
24tfdb A. H. DUFF, Creighton, Guern. Co., O.

WANTED.—To exchange strawberry and raspberry plants for $1.00 or tested queens, or pounds of bees (in spring). Address 21fdb
C. W. PHELPS & Co., Tioga Centre, Tioga Co., N. Y.

WANTED.—To exchange Simplicity hives for a circular-saw mandrel for hive-making by steam power. Will sell hives (in the flat) cheap for cash, or will take one-third pay in full colonies of bees. Hives in any quantity to suit customers, up to a carload per day. G. A. FARRAND,
3tfdb Rockport, Cuyahoga Co., O.

HONEY COLUMN.

CITY MARKETS.

KANSAS CITY.—*Honey.*—This market continues about unchanged, except that stocks are somewhat reduced, and, possibly, a little firmer feeling on extracted. The demand, however, is not heavy for this time of the year and we can't expect any better prices, as no one seems inclined to hold, and concessions all in buyer's favor. Choice 1-lb. sections were best at 15@16c; 2-lb., 13@14c. Extracted, 5@7c, according to quantity. *Beeswax* is in very light supply; would bring 22@25c for good average grades.

CLEMONS, CLOON & CO.,
Cor. 4th & Walnut St's., Kansas City, Mo.
Feb. 6, 1886.

NEW YORK.—*Honey.*—We note an improvement in sales of honey the past week, but prices continue to rule low. We quote as follows:

Fancy white comb, 1-lb. paper cartons,	13@14c.
" " " glassed or unglassed,	12@13c.
" " " 2-lb. glassed,	9@10½c.
Fair to good " " glassed,	8@9c.
Fancy buckwheat, 1-lb. unglassed,	10c.
" " 2-lb. glassed,	8@9c.
Extracted, white clover, per lb.,	6½@7½c.
" Buckwheat " "	5@6c.
Beeswax,	28@28c.

McCAUL & HILDRETH BROS.,
Feb. 10, 1886. 34 Hudson St., cor. Duane St.,
New York.

CINCINNATI. — *Honey.* — Demand for extracted honey is extremely slow. Manufacturers, apparently, are taking a rest. There is only a fair demand for honey in glass jars and for comb honey. Prices are unchanged and nominal, with occasional arrivals, and a large stock on the market. We quote extracted honey at 4@8c on arrival, and choice comb honey at 12@14c in the jobbing way. There is a good home demand for beeswax. We pay 25c per lb. on arrival.

CHAS. F. MUTH & SON,
S. E. Cor. Freeman and Central Avenues,
Feb. 2, 1886. Cincinnati, Ohio.

NEW YORK.—*Honey.*—There is a slight improvement in the honey market. We have had a fair demand for comb honey, and a very good demand for extracted honey for the past two weeks. The indications are that there will be a good demand for honey during February, March, and April, especially for the finer grades. We make no changes in our quotations from our last issue.

THURBER, WHYLAND & CO.,
Feb. 11, 1886. Reade & Hudson Sts., New York.

BOSTON.—*Honey.*—The sale for honey for the past month has been as light as we ever knew, and prices are weak. One-pound, white clover, 13@15: two pounds, 11@13; extracted, 6@8.

BLAKE & RIPLEY,
Feb. 11, 1886. 57 Chatham St., Boston, Mass.

CLEVELAND.—*Honey.*—There seems to be quite a little activity in our market now for choice 1-lb. sections, which sell at 14@15c; 2 lbs., not very active at 13@14c. Old honey, of which there is some still on hand, is very slow at 10@11c. Extracted, 7@8c. *Beeswax*, very scarce at 25c.

A. C. KENDEL.
Feb. 11, 1886. 115 Ontario St., Cleveland, Ohio.

CHICAGO.—*Honey.*—Market without special change from last quotations; choice comb honey in ¾ to 1-lb. sections is wanted in this market when put up in desirable shape.

R. A. BURNETT,
Feb. 10, 1886. 161 So. Water St., Chicago, Ill.

DETROIT.—*Honey.*—Was in the city yesterday and looked over the commission houses. Find honey dull. Best white in 1-lb. sections, 14c; larger sections a little less. *Beeswax*, 23@25c.

Bell Branch, Mich, Feb. 11, 1886. M. H. HUNT.

ST. LOUIS. — *Honey.* — The honey trade is slow. Comb, such as is on the market, is selling mainly at 12½c. Extracted, quotable at 8@10c. in cans, and 4½ to better for bbls., as to quality.

Beeswax.—We quote at 23c; demand good.

W. T. ANDERSON & CO.,
Feb. 11, 1885. 104 N. 3d Street, St. Louis, Mo.

FOR SALE, very cheap.—Six barrels white-clover, extracted honey, and four barrels fall extracted honey (Spanish needle and goldenrod). Samples sent on receipt of three 1-cent stamps for each sample.

EMIL J. BAXTER, Nauvoo, Ill.

HONEY AND BEESWAX.

We are now in the market, and will be during the entire season, for all honey offered us, in any quantity, shape, or condition, just so it is pure. We will sell on commission, charging 5 per cent; or if a sample is sent us, we will make the best cash offer the general market will afford. We will handle beeswax the same way, and can furnish bee-men in quantities, crude or refined, at lowest market prices. Our junior member in this deparment, Mr. Jerome Twichell, has full charge, which insures prompt and careful attention in all its details.

Sample of comb honey must be a full case, representing a fair average of the lot. On such sample we will make prompt returns, whether we buy or not.

CLEMONS, CLOON & CO.,
15-7db **Kansas City, Mo.**

DADANT'S FOUNDATION FACTORY, Wholesale and retail. See advertisement in another column. 3btfd

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FIRST IN THE FIELD!!

The Invertible Bee-Hive

Invertible Frames,

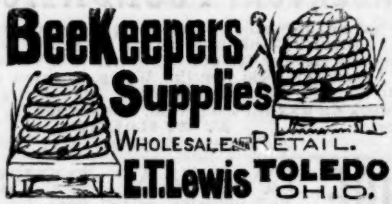
INVERTIBLE SURPLUS - CASES,

TOP, BOTTOM, AND

ENTRANCE FEEDERS.

Catalogues Free. Address

J. M. SHUCK, DES MOINES, IOWA.
4-3db



Orders filled the day they are received, except for bees and queens. 4tfdb

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ITALIAN BEES IN IOWA.

60 c. to $1.00 per lb. Queens, 30 c. to $2.50. Order from new circular, sent free. 4d

OLIVER FOSTER, Mt. Vernon, Linn Co., Iowa.

FOR SALE. Cigar-box planer, Root saw-table, 10 saws, grooving-table, 2 sets of saws, shafting and pulleys, all good as new, used two years; give us an offer; must be sold. Also 60 colonies of my improved Italian bees, in two-story chaff hive, at $8.00 per colony. A Given fdn. press and wiring-machine, for $25.00. A lot of 2-story chaff-hives, tin roof, with 2 crates, $2.50 each; former price, $5.00; 100 smokers, Clark's, at 25 cts. each; $22.00 per 100; 1000 Simplicity wired frames at $1.00 per 100; 1000 in flat, at 75 cts. per 100.

4tfdb **GEO. F. WILLIAMS, NEW PHILADELPHIA, O.**

PLYMOUTH ROCKS a specialty. No other fowls kept for 6 years. Eggs, $1.50 per 13; $2.50 for 26.
4-5d S. S. JORDAN, Hiramsburg, Ohio.